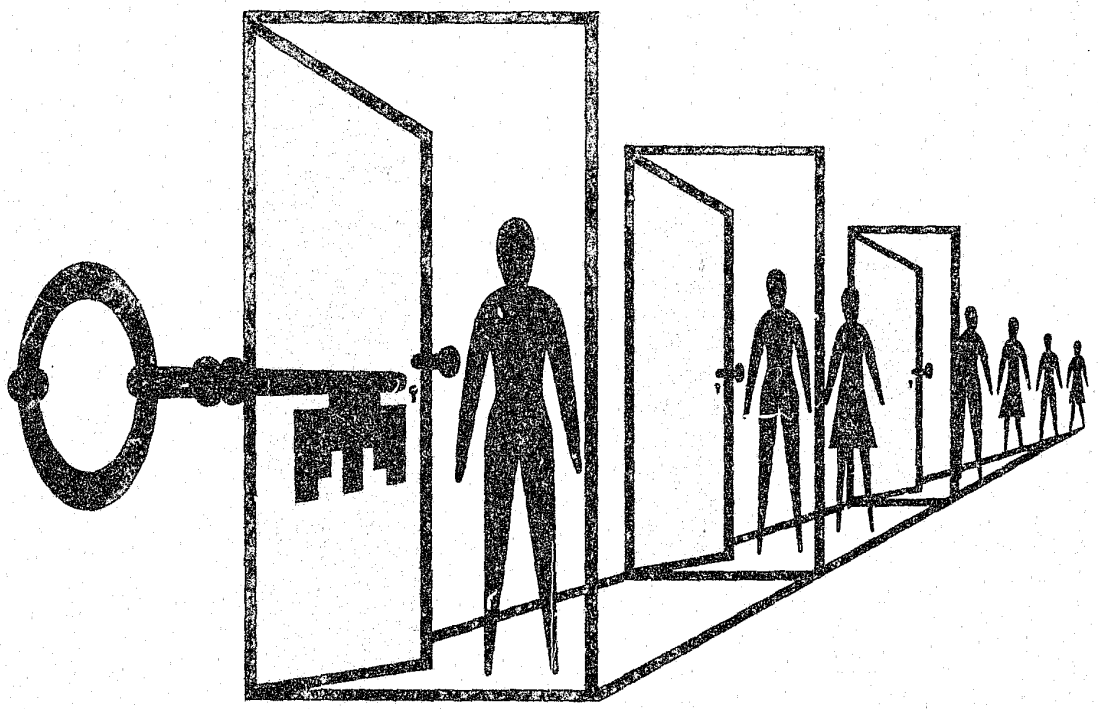
Putting Knowledge to Use:



A Distillation of the Literature Regarding Knowledge Transfer and Change

Human Interaction Research Institute
in collaboration with the
National Institute of Mental Health

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Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change

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TABLE OF CONTENTS

FOREWORD

The knowledge industry must surely be considered one of the majors in the nation. In research and development alone the Federal investment amounts to some $20-billion annually. Curiously, it is an industry where astonishingly little attention has been dedicated to the marketing of its product. In these days of accountability, many persons are asking "How have these products been used to help us?" For example, public interest groups and their Washington lobbyists are formally asking the question with implications of skepticism. But there is a still more compelling reason for defending a more systematic facilitation of knowledge utilization: in human services the well-being of millions of American citizens depends in part on the effectiveness and efficiency of those services. The effectiveness and efficiency, in turn, depend in part upon optimum input of relevant knowledge. The record has it that common influencers of policies and practices are socio-political pressures, personal predilections, and persistence of the way things have been done before. The use of new knowledge trails along behind. There is a responsibility for better knowledge transfer on the parts of both the knowledge producers and the policy and practice people.

But how can responsibilities for improved knowledge utilization be carried out? The literature on the topic offers advice. In fact, a surfeit of it. In the past 20 years the number of citations in the knowledge utilization field has grown from some 400 to an estimated 20,000 plus. If you venture into this literature in a quest for guidance, you stagger out reeling. The field abounds with assertions, conceptual models for analysis, and contradictory observations. But sound research information seems to remain in hiding.

Dr. Edward Glaser and his colleagues at the Human Interaction Research Institute (HIRI)—Drs. Harold Abelson, Michael McKee, Goodwin Watson, Ms. Kathalee Garrison, and Ms. Molly Lewin—have marshalled an assault, as it were, upon literature. They have ferreted out sounder facts pertaining to the process of knowledge utilization and driven out the seemingly useless material. And beyond that, they have distilled the essence of knowledge on knowledge utilization. The result is perhaps not quite a technology manual in itself, but it certainly does represent an orderly presentation of rich information that will be essential to anyone planning and developing better ways of knowledge transfer.

From the standpoint of NIMH's services research and development program, I should like to point out that HIRI material of this sort has been used as a basis for research utilization policy and practice decisions for eight years. During that time the "utilization rate" of projects has increased some eight-fold. In this program alone, it has led to fruitfulness of multiple millions in research investments. We are grateful to HIRI for its signal contribution. We hope others will find this newly revised material to be similarly beneficial.

Howard R. Davis, Ph.D.
Chief, Mental Health Services Development Branch
National Institute of Mental Health

PREFACE AND ACKNOWLEDGEMENTS

The present book is a revision of an earlier (1971) two-volume publication entitled *Planning for Creative Change in Mental Health Services: A Distillation of Principles on Research Utilization.*

The current publication omits the Annotations section of the earlier version but has added several hundred items to the bibliography; increased the number of summaries of books, articles, and studies by approximately 100; and reorganized and augmented the Distillation section. The following features are provided to assist readers in locating material of particular interest: a more detailed table of contents; clearer indication of topic and subtopic headings in the Summaries section; and assignment of a serial number to each summary as a reference aid when using the newly prepared indexes. There are three indexes to summaries, as follows:

1. Index to Change Aspects of the Development-Dissemination-Utilization Continuum
2. Index to Summary Study Mode or Type
3. Index to Areas of Application

We are grateful to Drs. Ronald G. Havelock and Thomas J. Kiresuk for their very valuable editorial critique and suggestions.

We are deeply appreciative of the help from Mrs. Susan Salasin, Chief, Research Diffusion and Utilization Section, who was the NIMH project officer on this effort. Her guidance with the initial planning of the revision, and her sustained counsel, together with similar support from Dr. Howard R. Davis, have contributed greatly to the development of the final product.

Edward M. Glaser

INTRODUCTION TO THE PROBLEM OF KNOWLEDGE UTILIZATION

Adoption Time-Lag

The problem of knowledge utilization emerges fundamentally from man's dual effort to maintain what he already has achieved and to improve upon it in the interest of enhancing the quality of life for himself or others. In today's rapidly changing world, the need for more effective ways to meet new or continuing problems calls for the identification and rapid dissemination of the fruits of research, experimental, and demonstration projects. To paraphrase H. G. Wells' well-known reference to the importance of education, civilization is a race between knowledge utilization and catastrophe.

In a very practical way, the matter has been put succinctly by Glaser and Marks (1966):

> All over the world people struggle with problems and seek solutions. Often those who struggle are unaware that others face similar problems, and in some instances, are solving them. It is destructive and wasteful that people should be frustrated and often defeated by difficulties for which somebody else has found a remedy. . . . The gap between what we know and what we put to effective use bedevils many fields of human activity—science, teaching, business management, and organizations which provide health and welfare services.

The time-lag between the conception of a desirable new idea and its adoption often occurs within the span of the research and development process itself as distinguished from time-lag in the utilization of the fully developed innovation. Thus, for example, A. Klein (1972) depicts the long struggle against polio—from the 1916 epidemic to the 1955 acceptance of the Salk vaccine; what was required was not merely a scientific advance, but also acceptance by the health professions and finally adoption by the people as a whole. The Battelle Columbus Laboratories (National Science Foundation, 1973) documented the amount of time required for ten innovative processes, products or techniques to move from the point of conception to the point of realization or culmination in terms of readiness for acceptance in the marketplace:

Innovation	Year of First Conception	Year of First Realization	Duration in Years
Heart Pacemaker	1928	1960	32
Input-Output Economic Analysis	1936	1964	28
Hybrid Corn	1908	1933	25
Electrophotography	1937	1959	22
Magnetic Ferrites	1933	1955	22
Hybrid Small Grains	1937	1956	19
Green Revolution: Wheat	1950	1966	16
Organophosphorus Insecticides	1934	1947	13
Oral Contraceptive	1951	1960	9
Video Tape Recorder	1950	1956	6
Average Duration			19.2

Though the consequences of scientific development lag are unfortunate enough, they are compounded by needless delays in the application of knowledge and wisdom already available for use. Of such delay there is ample evidence, as the following examples from the field of education indicate.

W. McClelland (1968b) reminds us of the slow acceptance of kindergartens over half a century. As noted by R. Lippitt (1965a): "A great proportion of the significant new inventions [in education] . . . remain quite invisible, undocumented, inaccessible for consideration by potential adopters." When a number of teachers were given special stimulation and aid in developing classroom innovations, all of them introduced changes in their own classrooms, but few of these new procedures were adopted by or even known to other teachers in the system (Fox & Lippitt, 1964). A study of reading texts used to teach elementary school children showed that few of the findings from a generation of very active research into the learning and teaching of reading had been incorporated into these tools for instruction (Barton & Wilder, 1964).

Many research findings that could improve practice are virtually unknown to the professionals because these findings never see the light of day. Halpert (1966) has observed that "innovators frequently do not write up their findings."

Glaser (1968) inventoried major advances in the comprehensive care and rehabilitation of persons suffering from chronic obstructive pulmonary disease and found that many of the most promising programs in current use had never been described in publications. Sometimes innovators, as they struggle to cope with difficult situations, are actually unaware that they have introduced a noteworthy innovation, so that no one ever reports the new design (Manela, 1969). In other cases, the research investigator is concerned with getting on to the next phase of his work and often begrudges the time required to write up his preliminary findings (Archibald, 1968; Bassett, Davison & Hopson, 1968).

Concern for utilization tends to be neglected when universities and other research units that train and reward researchers fail to emphasize applications. In their efforts to keep studies "uncontaminated" by practical considerations, they may at times concern themselves only with the value of a study for improving future research. If implementation were given more attention by those who fund, guide and influence research training, the lag in adoption time might conceivably be significantly decreased.

The Field of Knowledge Utilization

Knowledge utilization as a field of study is concerned with: (a) developing insights on the part of both knowledge producers and knowledge users into the underlying processes of knowledge development, dissemination and implementation; (b) identifying factors that account for delay in adaptation or adoption following the development stage; and (c) generating strategies or measures for enhancing appropriate and timely utilization.

Many principles of knowledge utilization are almost universally applicable to various subject matter fields, and many others can be linked by analogy or suggestion to fields other than those specifically studied. Therefore, this distillation of literature on barriers and gateways to knowledge utilization includes studies referring to general processes for facilitating knowledge validation and utilization, and to specific efforts in the mental health field and various other fields of endeavor.

The distillation and the accompanying literature summaries are designed to bring together the findings and implications contained in several hundred articles and treatises on various phases of the knowledge transfer problem. With so many authors involved, it is not surprising to find not only different approaches and different conclusions, but also different conceptions of various terms employed. For example, the term "research" may refer to anything from objectively and experimentally determined findings, to empirical surveys of subjective judgment, to informed expert consensus, to conventional wisdom, to generalization from a single striking case. Unverified knowledge, as such, is rarely differentiated from validated knowledge derived from credible research studies or careful, repeated observations. Innovation based on new research is not always distinguished from innovation based on the transfer of practice from one situation to another. These distinctions may not always be made when assigning the designation of innovation, as noted by Zaltman, Duncan, and Holbek (1973), who stress the importance of taking these and other differentiations into account when interpreting research. There also are differences in underlying schools of thought on many central issues regarding strategies of knowledge utilization. These are exemplified in the "power versus persuasion" controversy; cognitive appeals versus "attitudinal messages" in reducing resistance to change; the varied recommendations regarding the extent of participation in decision making within an organization in order to achieve unbegrudged compli-

ance; the placement of initiative for utilization in the researcher versus the user; the diverse roles suggested for and by change agents; etc. A useful question to bear in mind is: "*Under what conditions* does this or that strategy or procedure seem to be effective?"

Despite the limitations in the "state of the art" we hope that this distillation will provide the reader with an abundance of useful information, insightful understanding, and stimulating leads to new ideas.

Outline of the Distillation

The problems and processes of knowledge utilization are essentially of one piece as they apply to various fields of endeavor. The various aspects of the process defy clear separation. Research development shades into dissemination; dissemination into diffusion; diffusion into utilization; and utilization into adoption. Change and innovation are related concepts. Organizational change and attitudinal modification go hand in hand.

This interrelationship had to be simplified in order to organize the material under topical headings. Thus, Chapter II examines variables singly even though in live situations they always interact. Chapter III, which arranges the material under separate stages through which knowledge utilization proceeds, necessarily underemphasizes overlappings and interrelationships that normally occur. Chapter IV similarly separates the usual network of linkage phenomena. Chapter V focuses on the extent to which elements of the research-development-dissemination-utilization process have been synthesized and theorized to form coherent models, thereby furthering an awareness of the limitations of a piecemeal approach. Chapter VI briefly summarizes what went before and offers a forward glance at needed research to come.

DETERMINANTS OF KNOWLEDGE UTILIZATION

The effective use of knowledge or research to bring about needed improvements in conventional practice is determined by many variables, often functioning in combination. The present chapter sorts out these potential determinants as they apply to (a) the characteristics, as the case may be, of the information or innovation or the change itself; (b) the characteristics of the information transfer process; (c) the characteristics of the organization or community or situation in which the desired information or improvement would be expected to take root; and (d) the personal characteristics of those involved in adoption of the change. Evidential data and speculative analyses are included in the discussion. Treated individually in the present section, the factors are considered more fully in terms of patterns and change models in a later section.

An Overview of Change Variables

Lists of change variables, whether applied to projects, organizations, or concerned persons, have multiple purposes. Such lists focus the attention of change agents—researchers, knowledge disseminators, the practitioners alike—on key aspects of the total situation affecting change or innovation. They permit predictions of probable success and anticipation of obstacles to success. They aid in devising and applying practical measures and strategies for controlling the change process. They facilitate an orderly study of the subject and enhance the likelihood that meaningful conceptual models will emerge from such study.

The multiplicity of determining factors has led various writers to devise acronymic summarizing lists. These factors are listed and identified briefly on the following pages to provide the reader with a quick overview of likely influences affecting innovation. A given factor may apply to a project outcome or innovation, to an organization, or to persons—or to two or three of these categories.

THE *A VICTORY* FORMULATION OF CHANGE FACTORS

H. Davis (1971) has proposed the acronym A VICTORY as a convenient memory device for encompassing the eight factors he considers necessary and sufficient to account for organizational behavior related to the utilization of promising new knowledge. These A VICTORY factors have been derived from a variety of sources, such as R&D projects, case studies, clinical experience, integration of conclusions about current state-of-the-art knowledge and practice in given fields, etc. They may be seen as determinants of how a given organization will respond to a particular proposed innovation. Thus, they constitute a tool to identify an organization's *readiness* for adoption of a given change. They also constitute relevant considerations to keep in focus during the process of implementing a given change or innovation.

The A VICTORY formulation evolved from a behavioral model of change, in turn adapted from learning theory embracing such considerations as drive or motivation, the ability or capacity of the learner, and circumstances or stimulus conditions. A fuller treatment of the original mathematical form of the model is presented in Chapter V. Results from a number of experiments on barriers and gateways to knowledge transfer, as well as from literature surveys, have been matched with the behavioral factors.

The factors, or elements, of the model are defined briefly as follows:

- **A = Ability,** the resources and capabilities of the organization to implement and subsequently evaluate the innovation; sanctions of decision makers to adopt the innovation.
- **V = Values,** the degree of accord with the organization's philosophy and operating style.
- **I = Idea,** the adequacy of knowledge about the innovative procedure and the proposed action steps.
- **C = Circumstances,** features of the organization environment relevant to successful adoption or adaptation of the innovation.
- **T = Timing,** readiness to consider the innovation; the particular combination of events at a given time that might affect the likelihood of implementation.
- **O = Obligation,** the felt need to change from existing modus operandi—or at least to try the proposed change.
- **R = Resistances,** inhibiting factors—the organizational or individual disinclination to change, for whatever reasons.

Y = Yield, the benefits or payoff from the innovation as perceived by potential adopters and by those who would be involved with implementation at the operating level.

As the A VICTORY technique has been applied in a variety of studies and programs, particularly those associated with the improvement of mental health services, both the richness and the potential effectiveness of the model have been demonstrated (Davis & Salasin, 1975). The eight components of the model, for example, have been extended into a set of over 40 questions one may ask concerning a potential change situation and a basic working list of about 50 prescriptive suggestions to which change agents may turn when approaching the task of achieving action or implementation of an acceptable idea for change (H. Davis, 1973). NIMH also employed the technique as a basis for organizing questions that may be asked in the conduct of program evaluation studies and, in collaboration with other agencies, has developed schedules or scales that may be used in assessing the likelihood of adoption of innovative programs by organizations or individuals (Davis & Salasin, 1975).

As an example of the use of the aforementioned set of 40 questions pertaining to the eight components of A VICTORY, a division of NIMH was considering the adoption of a new operational evaluation system. One hundred persons in five affected program components were invited to rate (adoption of) the proposed change with reference to the 40 questions. The results were as follows (Davis & Salasin, 1975):

> Total scores for each of the five program components matched precisely the overall ratings of adoption by the five respective components. . . . Responses were consistently on the positive side on such dimensions as Idea, Obligation, Values, and Yield insofar as the program benefits were concerned. They were consistently negative on the side of Ability, Circumstances, Timing, and Yield in terms of personal benefits. The persons to be involved with the change were saying, in effect, that the new system was clear, that they had no intention about rebelling against any instructions to adopt the system, that it was the thing to do and finally that the program would benefit from such adoption. But at the same time they were saying that it was a time-consuming endeavor to maintain, perhaps one for which the payoff was not commensurate with the time and energy demanded. That particular point in time was a poor one to initiate such a system because cutbacks in funds and staff appeared to be so imminent at that point. Perhaps for that reason the proposed evaluation system was perceived as being potentially threatening and even detrimental to maintaining program performance. There was little chance of gaining personal benefits from the proposed system. Subsequent discussions with personnel precisely confirmed these impressions, gross as the assessment had been. In consequence, the change process was slowed until environmental circumstances became more sanguine, the system was redesigned to require far fewer resources, participative planning was followed, and director-level staff gave individual reinforcement to persons engaged in maintaining the system. Administratively, from the short view, addressing the views of personnel meant that implementation of the system fell months behind schedule. And its final form differed from the initial plan. But from the long view, the modified plan proved to be both more effective and efficient than the initial one would have been . . .

THE *CORRECT* LIST OF CHANGE FACTORS

An acronymic list of characteristics of a research finding or innovative procedure that may affect its adoption/implementation by others has been proposed by Glaser (1973) under the title, CORRECT. It entails the following attributes, some of which were previously identified by E. Rogers (1962a):

1. **Credibility**—stemming from the soundness of evidence for the innovation's value or from its espousal by highly respected persons or institutions.
2. **Observability**—the opportunity for potential users to see a demonstration of the innovation or its results in operational practice.
3. **Relevance**—to coping with a persistent or bothersome problem of concern to many or to influential people.
4. **Relative advantage**—cost-benefit or other advantages over existing practices; the conviction that improvement will more than offset additional effort which may be required to adopt or adapt the change.
5. **Ease in understanding and installation**—as contrasted with difficulty of putting into operation or transplanting from another setting.
6. **Compatibility**—with potential user's values, norms, procedures, and facilities.
7. **Trialability, divisibility, or reversibility**—which permits a pilot tryout one step at a time and does not call for an irreversible commitment.

In the same source Glaser sets forth a number of determinants of the likelihood of successful transfer of an innovative practice. Several of these refer primarily to *characteristics of potential users* to whom the information or innovation is addressed. (These determinants readily can be translated into Davis' A VICTORY factors; they simply were formulated independently and thus described in slightly different terms):

1. Leadership's willingness to *entertain and respond nondefensively* to internal or external challenge of its operation or practices.
2. The *capability* of staff and the availability of necessary *resources.*
3. *Sensitivity to context factors* such as clients, communities, governmental control, and public opinion—to outside pressures and to environmental and administrative changes.
4. *Skill in working through resistances.*

Other factors noted in Glaser's 1973 paper refer to the information transfer process. For example:

1. *Early involvement of influential potential users* in the planning, research, and development of the innovative practice.
2. *Supplementary support* concerning the innovation beyond informational communications, such as providing technical assistance, seminars, packaged material, etc.
3. *Personal contact*, including solicitation of assistance from "gatekeepers."
4. *Suitable timing* in the application of dissemination strategies.

Still other determinants that tend to represent facilitating forces for application of a promising innovation are:

1. *A climate of trust* within which the change advocate endeavors to function.
2. *Critical information* regarding anomalies in what heretofore have been accepted as "truths"; inadequacies, or widespread feelings of need for corrective action to overcome conditions that seem seriously undesirable.
3. *An incentive system* providing rewards for certain changes or types of behavior.
4. Stimulation of *shared interest in solving commonly recognized problems* (sometimes achieved through systematic feedback of goal-attainment progress).
5. *Structural changes*, or organizational rearrangements that require adoption of certain procedures or action, e.g., an administrative ruling or law that requires a child-care institution, nursing home, or whatever, to comply with certain explicit and ascertainable standards if it wishes to be certified as eligible to receive referrals from given public agencies.

THE ZALTMAN LIST OF INNOVATION ATTRIBUTES

Zaltman et al. (1973) offer the following list of attributes that are relevant to describing, explaining, and predicting responses to innovations:

1. *Cost*—financial and social, initial and continuing.
2. *Returns to Investment*—tangible and intangible.
3. *Efficiency*—overall timesaving and avoidance of bottlenecks.
4. *Risk and Uncertainty*—on the part of early adopters, lessened for later adopters.
5. *Communicability*—ease of dissemination and clarity of results.
6. *Compatibility*—consistency with "existing values, past experiences, and needs of receivers."
7. *Complexity*—of ideas and in actual implementation.
8. *Scientific Status*—reliability, validity, generality, etc.
9. *Perceived Relative Advantage*—its visibility and demonstrability.
10. *Point of Origin*—whether from within or from without the organization.
11. *Terminality*—point beyond which adoption becomes less rewarding, useless, or even impossible.
12. *Status Quo Ante*—reversibility and divisibility.
13. *Commitment*—prior attitudinal or behavioral acceptance.
14. *Interpersonal Relationships*—impact on a disruptive-integrative continuum.
15. *Publicness versus Privateness*—availability to all members of the social system.
16. *Gatekeepers*—number of approval channels.
17. *Susceptibility to Successive Modification*—ability to refine, elaborate, or modify innovation.
18. *Gateway Capacity*—opening of avenues to other innovations.
19. *Gateway Innovations*—instrumental setting of stage for large-scale innovations.

These authors note that the attributes may apply differently to the different stages of the innovative process and to different organizations with diverse characteristics.

An essentially similar set of characteristics is presented in Lin and Zaltman (1973), with a chart listing characteristics of innovations as discussed in a number of articles published between 1962 and 1971.

THE *HELP-SCORES* CHANGE VARIABLES

Another set of project or change variables has been proposed by Havelock and Lingwood (1973) as a rating schema for diagnosing problems in the communication of new knowledge or innovations from any sender to any receiver. This set of concepts follows the acronymic designation, H-E-L-P S-C-O-R-E-S:

1. **Homophily:** Similarity of characteristics of sender and receiver.
2. **Empathy:** Understanding and feeling for the other and the other's situation.
3. **Linkage:** Contact or relationship between persons or groups.
4. **Proximity:** Placement of persons or groups near each other.
5. **Structuring:** Evidence of planning, ordering, systematic arrangement.
6. **Capacity:** Sign of affluence, talent, experience, wisdom, etc.
7. **Openness:** Sign of willingness to listen, receive, give, tell, etc.
8. **Reward:** Provision of financial support, security, esteem, status, etc.
9. **Energy:** Investment of time and effort, persistence, aggressiveness.
10. **Synergy:** Coming together of forces, orchestration, synchronization, etc.

High ratings on each of these dimensions are related to more successful communication and utilization of research knowledge.

ADOPTION FACTORS CHARTED

Although all four listings of factors that may influence likelihood of adoption of an innovation are couched in different terms, they are related in many respects, as Table 1 suggests. The table presents the terms in juxtaposition with the A VICTORY list. To be sure, the meanings differ somewhat from list to list, but nevertheless there is appreciable overlap.

OTHER SUGGESTED CHANGE-FACTOR LISTINGS

The Battelle list. The Battelle Columbus Laboratories (National Science Foundation, 1973) studied 21 factors of probable importance to the direction and rate of the innovative process. These factors were selected from the general literature on the subject of variables influencing the adoption of innovations. Each factor was rated for degree of importance to each decisive event in the history of ten outstanding scientific or technical innovations. In the order of significance, as measured by the percentage of decisive events to which they applied, the 21 identified factors were:

1. Recognition of technical opportunity.
2. Recognition of the need.
3. Internal R&D management.
4. Management venture decision.
5. Availability of funding.
6. Technical entrepreneur.
7. In-house colleagues.
8. Prior demonstration of feasibility.
9. Patent/license considerations.
10. Recognition of scientific opportunity.
11. Technology confluence.
12. Technological gatekeeper.
13. Technology interest group.
14. Competitive pressures.
15. External direction to R&D personnel.
16. General economic factors.
17. Health and environmental factors.
18. Serendipity.
19. Formal market analysis.
20. Political factors.
21. Social factors.

The authors group or relate the factors to each other as follows:

Factors 1, 2, and 10 are related to various *motivational influences.*

Factors 3, 4, 5, and 19 involve *action taken consciously by management.*

Factors 6, 8, 9, and 12 *may involve management in some sense,* but do not necessarily imply specific action by management.

Factors 7, 13, 14, and 15 describe *peer-group* forces that impinge on the R&D scientist.

Factors 11 and 18 are circumstances that are usually *unplanned or accidental.*

Factors 16, 17, 20, and 21 refer to the *general environment* within which the innovative process takes place.

The above order of importance ascribed by the Battelle study to the 21 identified factors probably is specific to scientific and technical innovations.

Havelock's factors. In another study that may be cited in contrast, Havelock (1974b) asked school superintendents to rate a series of statements pertaining to innovative procedures.

The listing of procedures affecting the success of innovative projects in education, according to Havelock's factor analysis of superintendents' ratings, is as follows:

1. Factor I: *Problem-solver perspective:*
   a. Maximizing chances of participation by many groups.
   b. Finding shared values as a basis for working.

c. Providing a climate conducive to sharing ideas.
d. Stressing self-help by the users of the innovation.

2. Factor II: *RD&D perspective:*
   a. Systematic evaluation.
   b. Solid research base.
   c. Systematic planning.
   d. Adequate definition of objectives.
   e. Adequate diagnosis of the real educational need.
3. Factor III: *Strategic manipulation:*
   a. Participation by key community leaders.
   b. Taking advantage of crisis situations.
   c. Involvement of informal leaders of opinion outside the schools.
4. Factor IV: *Open advocacy and humane dialectic:*

TABLE 1

Factors Influencing the Likelihood of Adoption or Adaption of a Seemingly Promising Innovation by an Organization: Integrated Findings

H. Davis (8 Factors)	E. M. Glaser (20 Factors)	G. Zaltman et al. (Condensation of 19 Factors)	R. Havelock et al. (10 Factors)
Ability to carry out the change	Capability and resources	Financial and social costs	Structuring Capacity
Values or self-expectancy	Compatibility	Compatibility Publicness vs. Privateness Impact on interpersonal relations	Homophily Empathy
Idea or information about the qualities of the innovation	Credibility Ease in understanding and installation Observability Trialability Divisibility Reversibility	Communicability Divisibility Reversibility Complexity of concept or implementation Susceptibility to successive modifications Scientific status Point of origin Terminality	Openness
Circumstances which prevail at the time	Willingness to entertain challenge A climate of trust Structural reorganization		Proximity
Timing or readiness for consideration of the idea	Sensitivity to context factors Early involvement of potential users Suitable timing		Linkage Synergy
Obligation, or felt need to deal with a particular problem	Relevance Widespread felt need to correct undesirable conditions Shared interest in solving recognized problems	Degree of commitment	Energy
Resistance or inhibiting factors	Skill in working through resistances	Risk or uncertainty of various kinds Number of gatekeepers or approval channels	
Yield, or perceived prospect of payoff for adoption	Relative advantage An incentive system	Efficiency of innovation Perceived relative advantage Gateway to other innovations	Reward

a. Confrontation of differences.
b. Resolution of interpersonal conflicts.
c. Creating awareness of the need for change.
d. Creating an awareness of alternative solutions.
e. Providing a climate conducive to risk taking.

5. Factor V: *Financial capacity.*
6. *Complex items:*
   a. Selecting a competent staff to implement change.
   b. Utilizing a number of different media to get new ideas across.
   c. Persistence by those who advocate the innovation.

Rothman's list. Perhaps the largest list of potential change factors has been assembled by Rothman and his staff (Rothman, 1974) in a study sponsored by the National Institute of Mental Health. From a pool of 921 carefully chosen research reports on planning and organizing for social change, some 228 "generalizations" relative to change variables were derived. For example, a generalization relative to personnel notes that role orientations may be differentiated depending on whether the milieu is professional, bureaucratic or client centered. The descriptive statements, which are accompanied by "action guidelines" and supportive material from the sources examined, are presented in chapters bearing the following titles:

1. Practitioner roles: variables affecting role performance.
2. Practitioner roles: some dynamics of role performance.
3. Organizational behavior: contextual factors.
4. Organizational behavior: technology and personnel.
5. Political and legislative behavior.
6. Participation: voluntary associations and primary groups.
7. Participation: social movements, political action, client organization.
8. The diffusion and adoption of innovations.
9. Movement and assimilation of populations.
10. Research utilization as a process.

The aforementioned lists of change factors differ from one another in their relative emphasis on determinants of change as they affect a particular innovative project, its organizational setting, and the persons who are concerned with the change, as has been noted. But they also vary in respect to their usefulness to the several types of persons who may be interested in change processes. Those who are engaged in an immediately practical field situation may require a pithy, succinct set of considerations by which to work. Researchers in the area of change phenomena may wish to explore the possibilities of a larger number of variables, including those regarding which validity has not yet been fully established.

Researchers and practitioners will have to consider the problem of interaction among variables in producing innovative effects; that is, in studying forces operating for or against change. Further, the relation between a variable and its change effect need not be linear; there may be sharp cut-off points marking change from nonchange. Variables may have to be studied in combinations, in keeping with a multiple regression model.

Considerations such as these need to be kept in mind as studies of single variables are reported.

Project Variables

In this section an attempt is made to distill from the literature those analyses and suggestions having to do with project variables that affect change. The term "project" is used in the sense of a designated innovation or an instance of knowledge transfer. Three subsequent sections present separate distillations of communications variables, organizational variables, and of personal variables that bear upon knowledge utilization/change.

In considering project characteristics that may affect change or innovation, the following headings are used for convenience:

1. Advantage (awareness of relative benefits)
2. Conformity (compatibility with established values)
3. Comprehensibility (ease of understanding and implementing; teachability)
4. Capability (fiscal, manpower and physical resources)
5. Demonstrability/Revocability (observable gains/trialability; reversibility)
6. Championship (advocacy by influential persons or sources)

As evident from Table 1 previously presented, different terms as used by various authors may be translated into a common framework such as that proposed by H. Davis (1971).

ADVANTAGE

An innovation which offers promise for achieving desired results in dealing with a persistent and vexing problem of concern to a great many people is more likely to spark interest than one which either is not of general concern or pertains only to a relatively small number of potential beneficiaries

(Miles, 1964c; Glaser & Taylor, 1969).

Innovations that appear to potential adopters to have relative advantage over existing practices, especially when espoused by highly respected opinion leaders, are more readily adopted (Barnett, 1953; Hovland, Janis & Kelly, 1953; E. Rogers, 1962; Bright, 1964; Coleman, Katz & Menzel, 1966a). A certain change in factory machinery might be an improvement, but one which would be worth less than it would cost to introduce; thus, it would have no relative advantage.

Changes that are inexpensive and can be accomplished with already available materials, persons and skills can be quickly introduced. Those that require large investments of money, time and energy will necessarily come more slowly (Miles, 1964c).

Innovations in the social services may be hindered in this respect since their relative advantage is often difficult to assess (E. Rogers, 1968). "Advantage" includes psychological as well as economic or material factors. For example, an innovation also may have consequences for prestige, convenience, and satisfaction that are perceived as advantageous by the adopter. Or an innovation may subsequently require changes in the power structure or social structure of an organization that might well be perceived as disadvantageous to those who feel their status might be adversely affected. Bowman (1959), analyzing the motivation for community action in mental health, discovered that sometimes the beneficial "side effects" became important enough to obscure the original goals. For example, the allowance for "overhead" in a research grant may be more important in the mind of an administator than the ostensible purpose of the research.

CONFORMITY

Innovations are more acceptable if they seem compatible with the user's previously established values, norms, procedures, and facilities (Guest, 1962; E. Rogers, 1962a; Katz, 1963a; Miles, 1964c; Niehoff, 1966; W. McClelland, 1968; Zaltman et al., 1973). A new drug "fits in" easily with customary medical practice; the use of subprofessional staff is a different matter. Relatedly, a potential adopter's main occupational interest seems to have a "halo" effect in contributing to rapid adoption of innovations most closely allied to that interest (Fliegel & Kivlin, 1966).

To cite findings from still another field, M. Becker (1970) presents two positive criteria in determining the adoptive potential of medical programs: (a) practical value in the minds of professionals; and (b) ease of communication to other professionals. On the other hand, six negative criteria are indicated, as follows: (a) represented a major departure from traditional public health activity; (b) conflicted with important values in the health field; (c) might be opposed by the county medical society; (d) might be opposed by interested groups in the community; (e) if adopted, would threaten the health officer's reputation; and (f) if adopted, would threaten or conflict with established economic interests.

Compatibility appears to be an important variable in the adoption of innovations in the field of mental health. For example, one study based on interviews with 25 practicing psychiatrists found very little impact of recent developments in neurophysiological research upon private practice although the psychiatrists were generally aware of these recent developments. This finding was attributed to the fact that the theoretical framework of the psychiatrists (psychodynamic) was not compatible with the theoretical assumptions on which the research was based (Rose & Esser, 1960).

A number of writers (e.g., Zander, 1962; Bright, 1964; R. Lippitt, 1965a, 1965b, 1966) note that innovative practices are frequently in conflict with existing attitudes, customs, and values of both the researcher and the practitioner. When this is so, it serves to discourage adoption. In terms of conflict with the values and behavior of practitioners, Rosenblatt (1968), Berlin (1969), and Matheson and Sunderland (1969) note that much basic research is considered inapplicable in many settings, thus is incompatible and unlikely to have much impact.

Glaser and Ross (1971) comment that for an innovation to be acceptable, it must be assimilated within the professional ideology of the potential adopter. They note that the field of mental health service delivery tends to be characterized by schools or ideologies to which staff are committed; for example, psychoanalysis, nondirective counseling, or behavior modification. The ideological orientation of an agency implies a coherent and congruent set of principles and techniques with which the proposed innovation must be compatible. Suggested changes to improve effectiveness of administration, intake procedures, or treatment scheduling that do not challenge the prevailing ideology may sometimes be made by administrative fiat; but those that run counter to the existing school of thought, such as the introduction of group procedures in an agency oriented toward

individual psychoanalytic therapy, would require a change in ideological acceptance prior to introduction.

According to Mackie (1974), human learning research has had relatively low applicational potential. Mackie notes a number of considerations that relate to the lack of conformity between the conditions underlying research experiments and applicational conditions. These have to do with:

1. The basic motivation of the experimenter as compared with the practitioner.
2. The experimenter's selection of tasks in terms of his theoretical position and/or how conveniently they can be generated by the types of available equipment.
3. The stimulus and response characteristics of the tasks employed.
4. The limitation in the response repertoire permitted.
5. The motivation of the participating subjects.
6. Time compression.
7. Difference in experimental environment.

Using a semantic and logical analysis, Barnett (1964) has developed a paradigm in which change *acceptance-rejection* possibilities in any given confrontation of a person with a message may be systematically and exhaustively explored. Whether a new message (an innovation) will be accepted or rejected depends on many factors. First, it depends on the structural demands of the language and the resultant relationships inherent in the message. Second, and most important, the message must "make psychological contact with some antecedent experience of its potential acceptor." In addition, the author discusses the concept of "values" and points out that actual acceptance or rejection is based on the individual's values and preferences.

COMPREHENSIBILITY

Other things being equal, a change that is easy to understand and to implement is more likely to be adopted than one which is complex and difficult to learn or put into operation. Replication requires feasibility for transfer to other settings (E. Rogers, 1967a; Rogers & Svenning, 1969).

Abelson (1970) reports that the technicality of a prescriptively stated psychoeducational idea, as judged by the investigator, is inversely related to its importance and its application to teaching practice, as judged by teachers; i.e., the higher the technicality, the lower the two criterial ratings. When 120 statements of ideas were sorted according to the aspect of the teaching-learning process to which they applied, those pertaining to pupils and to teaching procedures were rated higher in importance and in application than those dealing with curricular selection, organization, or sequencing. However, since the last-named group was also more technical, as independently judged, than the first two categories, it is possible that technicality may be a concurrent factor in accounting for the ratings obtained, and that this factor also may apply to the characteristics of other ideas under consideration for adoption. Thus, the need to make the technical content of innovative material as clear as possible under given circumstances is affirmed to the extent that the several sets of judgments described in the study reflect objective conditions.

Zaltman et al. (1973) note (as have other authors) that complexity of ideas as well as difficulty in their implementation are deterrents to the adoption of innovations.

CAPABILITY

As noted by H. Davis (1973), for a desired change to become actualized, there must be staff skills and knowledge appropriate to the change. In general, where skills are not already available, it is necessary to examine a projected innovation in terms of its teachability or its learnability.

Argyris (1974) has attributed the failure of most innovative experimental schools largely to the fact that those staff and board members who espouse freedom, mutual trust and community decision making are usually unaware that they have been "programmed" throughout their lives to "Model I" (controlling, winning, avoiding negative criticism) and in their actual behavior they contradict their proclaimed values. He documents his thesis from analysis of the minutes of staff and board meetings in three experimental schools. In a later work, Argyris and Schon (1974) offer a prescription for the training necessary to bring actual behavior of teachers and administrators into accord with their espoused theories.

DEMONSTRABILITY/REVOCABILITY

Innovations also differ in the extent to which rewards are observable. The more obvious and tangible the gains, the greater the probability of adoption (Flanagan, 1961; Mansfield, 1963b; Glaser & Taylor, 1969). E. Rogers refers to this as communicability (1962a, 1967a). When people can see the results of using a new idea, they are more apt to adopt. Hence, at least within the practical frame of reference of these studies, nonmaterial ideas have been found to diffuse more slowly than material innovations.

Changes that can be tried on a pilot basis in a few

situations are more readily accepted than those which make an all-or-none demand on the entire system. This characteristic, sometimes called "trialability," reduces the perceived risk of an innovation and lessens resistance (Bright, 1964; Rogers & Svenning, 1969).

The extent to which a proposed change is known to be reversible if it does not prove desirable may affect its adoption. Not all innovations can be discarded later with impunity. The bridges back to the status quo ante may have been burned. Situations in which the user need not "play for keeps" provide more opportunity for innovation (Miles, 1964c; Lippitt & Havelock, 1968; Zaltman et al., 1973).

In a socio-technical worklife research study conducted in Norway under a steering committee of the national unions, the national employers confederation, and the government, it is interesting to note that the researchers protected both the workers and management by minimizing the extent to which either would be committed to long-term acceptance of experimental changes (Thorsrud, 1968).

If a proposed change is divisible, so that it can be introduced one step at a time, with opportunity to assimilate each stage before the next comes on, it will arouse less resistance than would more wholesale change (E. Rogers, 1962a; Fliegel & Kivlin, 1966).

CHAMPIONSHIP

Championship (or advocacy by influential persons), which may be internal or external, may be added to the list of characteristics affecting the adoption of innovation. W. McClelland (1968b) notes that almost no ideas or projects are accepted solely on their own merits. The study by Fairweather, Sanders, and Tornatzky (1974) concludes that "it appears necessary to locate small change-oriented groups within an organization that wish to change it, and then to constantly reinforce their movement toward change. No change occurs without persevering action behaviorally directed toward change."

Of special relevance to championship is the point made in the Battelle study previously cited that a technical entrepreneur (an individual within the performing organization who champions a scientific or technical activity) ranked sixth in importance for innovation, considerably higher than the twelfth-ranked technological gatekeeper (an individual who identifies scientific or technical information of relevance to the interests and activities of the researchers). As the technological gatekeeper would have a more intimate and continuing relationship with the R&D team, one might expect his influence to be higher than the technical entrepreneur, but the data show otherwise.

If an innovation is espoused by an eminent, highly respected person or group, at least its initial acceptance is more likely than if the same innovation were espoused by a less eminent person or group. For example, when Linus Pauling, Nobel prizewinner in biochemistry, published *Vitamin C and the Common Cold* in January 1970, there was a mass surge toward "instant adoption" (at least at the time, or for a tryout). Drugstore shelf stocks of vitamin C tended to be sold out across the country within a few days. Enhanced credibility afforded by Dr. Pauling's status, was, to be sure, aided by other factors such as relevance to a common, bothersome problem; simplicity; trialability; etc.

Fairweather's studies (1971, 1973; Fairweather et al., 1974) indicate that change is unlikely without outside pressure and guidance as well as inside championship. H. Davis (1972) came to a similar conclusion based on a study of NIMH projects. He found a need for outside pressure or advocacy from the beginning if the projects are even to be reported in full, much less adopted. For example, before 1966, no grant project monitoring or control system was in use for applied research at NIMH after the grant award determination. An attempt to assemble all of the findings of mental health projects funded by the Institute yielded final reports from only 40 percent. By beginning (in 1966) to institute outside pressure in the form of program monitoring at the *outset* of project activities, the percentage of final reports submitted gradually rose to 95 percent, where it has remained.

Numerous authors (e.g., Halpert, 1966, 1972; Fairweather, 1971; H. Davis, 1972) have commented that many of the persons involved in testing or demonstrating innovative mental health delivery techniques are practitioners rather than scientists, and their primary goal is to provide good service, and not to assess and disseminate project results, according to the Davis findings. Continued reminders of the importance of the project payoff are more important in service research than in fundamental research. Thus, the external champion needs to supplement the other project factors discussed above.

Communication Variables

How new ideas or practices are presented affects acceptance. Often there is perceived or vaguely felt threat by recipients with regard to

new information or proposed change from conventional practice. Some reasons for such resistance, and factors bearing upon it, already have been discussed. Two process elements which have been found to reduce resistance are: (a) the use of person-to-person communication, especially when emanating from respected or influential peers, and (b) the solicitation of involvement or collaboration in the development of the information or innovation by respected representatives of potential user groups.

John Salasin, in a personal communication to the author, has summarized some key research results bearing upon the above observations:

> One study of change (Coleman, Katz and Menzel, 1966) focused on the introduction of a new drug and its acceptance, through time, among prescribing physicians. The study's findings indicate that, while several channels of influence usually preceded use of the new drug by a physician, a social intermediary (detail man or colleague) rather than impersonal media (journals, house organs, etc.) was frequently indicated as the major source of information leading to prescription of the drug. The sources of information reported by the physicians were as follows: 57 percent said they first learned of the drug from the detail man, 18 percent learned from direct mail from drug houses, 7 percent named a professional journal, and 7 percent named another physician. Almost 90 percent of the doctors sought or awaited word from at least one source before first using the drug; 62 percent indicated that they received the information from three or more sources before use.
>
> A study on the diffusion of hybrid seed corn (Ryan and Gross, 1943) indicated that almost one-half of the farmers interviewed cited personal contacts with salesmen as the earliest source of information. Ten percent named radio advertising as their first source. About 15 percent indicated that neighbors had provided the information while 11 percent named farm journals. The findings indicated that, while professional salesmen served the introductory function, neighbors were the most influential in activating adoption of the hybrid corn.
>
> A retrospective study (Roberts and Larsen, 1971) was conducted by identifying innovative programs already introduced in mental health institutions and tracing the innovation backwards to the source of the information. Results of the study indicate that the primary source for innovative ideas was personal contact. Formal communication channels (e.g., books, journals, speeches) played a much lesser role.
>
> The potential value of person-to-person communication as a mechanism for facilitating change seems well established. Another characteristic which may facilitate change is collaboration between developers and users of knowledge. Ideally, in considering researcher-practitioner exchange, collaboration should include problem formulation, study design, data collection, interpretation of results, and application of findings. The . . . study [Glaser and Taylor, 1969] . . . of successful as opposed to unsuccessful applied research projects emphasized the value of collaboration between knowledge developers and knowledge users. The study found that successful research projects were characterized by a high level of communication with and involvement by potential users. The project staff of successful projects made efforts to induce interest and cooperation from a wide group of supporters and potential users. Potential obstacles became shared concerns. Resolution of these obstacles, by both research project staff and potential users, often provided unanticipated benefits which strengthened the project.
>
> Scientific meetings can provide a means for such collaboration. A meeting (Glaser, 1968) to examine patient regimens for chronic obstructive pulmonary disease resulted in the conferees achieving a sharper identification of unresolved questions that needed further experimental study. Meeting attendees expressed a willingness to collaborate following the meeting in seeking further knowledge. The meeting promoted awareness of treatment programs, some of which had never before been described or published in detail. Finally, the meeting resulted in the strengthening of an interdisciplinary network of communication regarding the diagnosis and treatment of chronic obstructive pulmonary disease.

Organizational Variables

Kogan (1963) and others have noted that the likelihood of successful innovation depends in part

on an organization's openness to change. Thus, organizational variables themselves are often most influential in determining utilization of research (Kogan, 1963).

In the study of the relation of these variables to innovative change or to knowledge utilization the "organizations" referred to range from definitive units such as offices or factories, to social institutions such as a school system. The studies here reported deal mainly with the smaller, more concrete settings, but reflect general principles of organizational functioning.

E. Rogers (1973b), based upon evidence he has accumulated, places emphasis on the importance of the effect of a system's social structure upon the diffusion of innovations. He sums up his position in nine propositions, as follows:

1. Social structure acts to impede or facilitate the rate of diffusion and adoption of new ideas through system effects.
2. Diffusion can change the social structure of a social system.
3. Power elites act as gatekeepers for entering a social system, while favoring functioning innovations that do not immediately threaten to change the system's structure.
4. A system's social structure helps determine the nature and distribution of an innovation's consequences.
5. Top-down change in a system, which is initiated by the power elites, is more likely to succeed than bottom-up change.
6. Bottom-up change involves a greater degree of conflict than top-down change.
7. Bottom-up change is more likely to be successful at times of perceived crisis in a system.
8. Bottom-up change is more likely to be successful when a social movement is headed by a charismatic leader.
9. The role of the charismatic leader in a social movement decreases as the movement becomes institutionalized into a more highly structured organization.

Rogers indicates that his propositions are not limited in their applicability to such specific behaviors as the diffusion of innovations, social movements, and the like, but deal with change and structure in a more general sense, including broad social movements.

Organization variables in this chapter are presented under four headings: goals; structure; communication and decision making; leadership and staff. However, several writers offer approaches that cut across these divisions. As reflective of the overlappings among these headings, one might consider the helpful analysis of the concept of organizational health, as presented by Benedict et al. (1966). Grouped under three headings, ten "dimensions" of organizational health are listed, as follows:

1. Task accomplishment:
   a. Reasonably clear, accepted, achievable, and appropriate *goals*.
   b. Relatively undistorted *communication flow* horizontally, vertically, and to and from the environment.
   c. *Optimal power equalization*, collaborative and based on competence rather than position.
2. Internal integration:
   a. *Resource utilization*, reflecting a good fit between personal dispositions and role demands.
   b. *Cohesiveness*, or "organizational identity".
   c. *Morale*, feelings of well-being and satisfaction.
3. Growth and active changefulness:
   a. *Innovativeness*, tendency to grow, change, diversify.
   b. *Autonomy*, ability to act "from its own center outward."
   c. *Adaptation*, changes in response to organization-environment contact.
   d. *Problem-solving adequacy*, ability to sense problems and effect solutions.

The following five organizational factors are presented by Zaltman et al. (1973) as affecting the innovative process:

1. *Complexity*—the number of occupational specialties and their professionalism.
2. *Formalization*—emphasis placed within the organization on following specific rules and procedures in performing one's job.
3. *Centralization*—the locus of authority and decision making within the organization.
4. *Interpersonal relations*—including degree of impersonality,
5. *Ability to deal with conflict*—as to whether to innovate and how to innovate; differences in goals, perceptions, etc.; intrapersonal, interpersonal, organizational, interorganizational, etc.

Walton (1975) studied the extent to which evidently successful experiments in work restructuring involving organizational change that had been applied to one section of eight large firms in the United States, Great Britain, Canada, Norway, and Sweden were subsequently adopted by other units of the respective firms. He found that the ex-

tent of diffusion varied widely within the eight firms. In four companies, diffusion was found to be nonexistent or small. In three companies, somewhat more diffusion occurred; however, the rate either was slow or had not been sustained. Only in one company was diffusion found to be truly impressive.

Elements that were considered relevant to the overall failure of diffusion were as follows:

1. Regression in the pilot project itself.
2. Use of a poor model for change.
3. Confusion as to what is to be diffused.
4. Inappropriateness of the concepts employed.
5. Deficient implementation and follow-through.
6. Lack of top management commitment.
7. Union opposition.
8. Bureaucratic barriers.
9. Threatened obsolescence.
10. Self-limiting dynamics, such as envy of rewards to the experimental group ("star" envy).

The author concludes his article with a number of observations:

1. An important reason for the unimpressive rate of diffusion in the eight companies studied is that the innovations had many attributes that made their diffusion inherently slow, such as low communicability and incongruence with existing norms and values.
2. A further reason relates to barriers the diffusion efforts encountered and the efficacy of the companies' strategies and tactics.
3. Careful and extensive planning is required to assure positive results.
4. The problems of increased local autonomy and threatened roles are not easily resolved.
5. The self-limiting dynamics of pilot projects are often unexpected; awareness may lead to greater success.
6. While the author expects little diffusion of potentially significant restructuring in the work place in the short run, he is hopeful that for the long run, future experiments will profit from the pioneering efforts.

Rothman (1974), in an extensive survey of literature, depicts organization variables of many kinds. In keeping with his interest in social work on a broad community-action level, the relations of organizations to their environments are considered along with the usual concerns regarding organizational goals, structure, bureaucracy, and operations. The role of both professionals and paraprofessionals is given considerable prominence in the discussion of organizational change phenomena.

These and a good many other organizational characteristics that bear upon receptivity to change are discussed in the sections that follow. Implied in the treatment of the material is the distinction between utilizing the characteristics of an organization to produce change, and utilizing change factors to alter the characteristics of an organization.

ORGANIZATIONAL GOALS

Whether goals are set *for* an organization or *by* an organization, certain considerations apply.

Clarity of goals. As conceived by Miles (1965), in a healthy organization, which also provides for distortion-free communication and an equitable distribution of influence, the goals of the system are reasonably clear to the system members and reasonably well accepted by them. Goals also should be achievable with existing or available resources, and should be appropriate. The ambiguity and diffuseness of educational goals, for example, diminish the effectiveness of educational organizations and impede institutional change (Halpin, 1962; Miles, 1965; Sieber, 1968). Two consequences of goal diffuseness in relation to education are identified by Sieber (1968) as (a) reinforcement of the effects of status insecurity and vulnerability concerning innovation; (b) difficulty in measuring the attainment of goals, which makes it hard to reach consensus regarding the efficacy of particular programs, methods, or skills.

As an aid toward the setting of group goals, Jenks (1970) recommends the use of a Q-sort, a technique whereby respondents sort statements of possible goals according to their degree of acceptability. The resultant judgments may then be subjected to discussion and reconciliation.

Another aid toward the setting of group goals is the use of a modified form of the Delphi technique. This technique was originally developed by Olaf Helmer and his associates at the Rand Corporation to facilitate the arrival at a consensus of expert judgment. As its name signifies, it is ordinarily applied to the prediction of developments and events in the future. It entails a procedure of written feedback regarding given questions which is iteratively shared anonymously among a group of knowledgeable and concerned persons, leading to reevaluation and further refinement. This procedure, however, can be applied to other matters, such as the clarification of the goals of a society, institution, organization or project.

In terms of the clarity and appropriateness of organizational goals, E. Rogers (1967a) raises an interesting point about how the "closure" orientation of vocational rehabilitation agencies serves to divert attention from consideration of innovative ideas. An emphasis on the quantity of closed cases

rather than the quality of services rendered leaves counselors with little time to "fool around" with research results, and also supports a focus on short-range goals, whereas the more significant gains from innovations are more likely to refer to long-range results.

Statement of goals versus job descriptions. When an organization such as a rehabilitation agency can: (a) hammer out its own optimal program outcomes, (b) set up process or time dimensions for instituting *agreed-upon* specific controls or performance criteria related to those optimal program outcomes, (c) measure performance, (d) provide timely feedback, and (e) offer rewards for superior performance in terms of goal attainment, the agency then has an input-process-output frame of reference which provides a system of accountability. This is likely to result in a closer relation between goals and the means of achieving them (Glaser, Coffey, Marks, & Sarason, 1967).

Written statements of organizational goals and proximate targets have been found helpful in reducing anxiety about change and in imparting a sense of security during the introduction of new procedures (Watson & Glaser, 1965; Miles, 1965; Fairweather, 1967; Howard, 1967; Bobbe & Schaffer, 1968; Schmuck, 1968).

In contrast to written goals, sharply defined job descriptions have been found to characterize organizations which are reluctant to innovate (Aiken & Hage, 1968). In the situations studied, the two observations combine readily in the idea that the best work is done when everyone shares the objectives, but each is relatively free to do his share of the common task in his own preferred way.

Social expectancies. Organizations of whatever type are seldom, if ever, wholly autonomous. They operate within a context of customers or clients, communities, governmental controls, and public opinion. The way in which an organization perceives its relationship to its larger social context is an important determinant of the kinds of change it wants or can accept (Lippit, Watson & Westley, 1958). Each social agency must protect ties to a supporting population and a client population. These relationships set limits beyond which the institution cannot go and survive. The perception of the limits may, however, be inaccurate. One service of a change agent is sometimes to investigate the validity of the perceived limits. Professor William H. Kilpatrick (Teachers College, Columbia University) used to tell teachers: "Your have more leeway than you suppose."

The pressure of social or political demand or expectancy undoubtedly varies with the innovation under consideration. For example, in the Battelle Columbus Laboratories study (National Science Foundation, 1973) of factors associated with technological innovations, such external considerations as political and social factors and health and environmental factors ranked relatively low. However, as Schon (1967) points out, this matter is a function of the country involved. In some countries (Japan, the Soviet Union, Great Britain) the government is a leading participant in technical innovation; in the United States, on the other hand, the government tends to set rules and policies that may affect innovation, and only rarely participates in the actual technical effort. It should be noted that Schon published his views in 1967. Subsequently there was evidence of greater technical participation by the United States, as witness the government's concern with the issue of productivity culminating with such reports as the following: (a) *Report on Federal Productivity*, Vol. I and II, Joint Financial Management Improvement Program, June 1974; (b) *Report on Activities to the President and Congress*, National Commission on Productivity and Work Quality, July 1967; and (c) *Report to National Commission on Productivity re: Diagnostic/Job Enrichment Study in Social Security Administration*, David Sirota Associates, Inc., June 1974.

Organizations obviously differ in their vulnerability to pressures from environmental forces. Vulnerability may be defined as the degree to which an organization is subject to powerful influences from its environment irrespective of organizational goals and resources (Sieber, 1968). For example, health agencies dependent on voluntary local support must be concerned with public opinion and politics more than those agencies privately endowed or nationally financed. Some good examples of the effects of organizational vulnerability are provided by Sieber, e.g., (a) changes in practice that might disturb the local community tend to be shunned; (b) the adoption of innovation often depends more upon political feasibility than educational value; (c) innovations receiving wide publicity through the mass media become candidates for adoption, irrespective of their educational value; and (d) internal relationships of a vulnerable system may be so affected as to limit the planned experimentation.

It is interesting to consider the factor of organizational vulnerability in relation to that of autonomy, which has been identified as a major dimension of a healthy organization (Miles, 1965). According to

Miles, the healthy organization has a sense of independence from the environment. Thus, vulnerability would appear to be in direct opposition to organizational autonomy, and hence to organizational health.

The characteristics of the community served by an organization affect its ability to innovate (Havelock, 1970). Not infrequently, the leaders of a school or a church or other social agency outrun the tolerance of the constituency and they are then reprimanded, constrained, or discharged (D. Ross, 1958).

Organizations pursuing objectives that are controversial in the larger setting have a conflict between their goals and their desire to be accepted in the community. A study of local affiliates of planned parenthood concluded that those units which were most concerned with keeping on good terms with other community agencies were less productive in achieving the objectives of planned parenthood. A degree of independence in pursuing the organization's own targets was deemed more effective and congruent with its functions (Rein, 1964).

Based on a conference of social scientists principally concerned with the manpower laboratory, Manela (1969) reported that some organizations (some persons and teams within the same organization) are oriented primarily toward output and reception of their product by clients. Others attend mainly to the internal operations and bureaucratic functioning. Those persons, sections, and institutions which, by choice or by necessity, attend carefully to the market are apt to be more responsive to the need for change. The more an organization is wrapped up in its own machinery and operations, the less likely it will be to innovate.

Even in carrying on the process of knowledge utilization, Paisley (1969) who examined studies on information needs and uses in 1967, views the person as being part of a "system," whether he be a knowledge producer, middleman, or user. This "knowledge system" is affected by other systems such as the cultural and political systems, the legal and economic systems, and one's membership and reference groups.

Approaching social change in terms of wide participation, Rothman (1974) devotes several chapters of his book to political and social behavior, voluntary associations and primary groups, social movements, political action, and client organizations. Action guidelines as to how these forces may influence change accompany sets of descriptive statements, or "generalizations" derived mainly from social science periodicals published during the period 1964-1970.

ORGANIZATIONAL STRUCTURE

The critical examination of the structure of an organization includes not only the distribution of power within it, but also its bureaucracy, occupational specialties, size and capacity, organizational inertia, and capability for self-renewal. A summary of these factors is presented below.

Distribution of power. Power and status distribution within the organization affect its ability to innovate (Lippitt et al., 1958; Miles, 1964d; Rubin, Plovnik & Fry, 1974). The organization may be too centralized, or too diffuse or spotty. The literature, however, is less than conclusive regarding this variable. Chesler and Fox (1967), for example, urge the decentralization of administrative decision making in educational institutions in order to accommodate greater participation by staff. Similarly, both E. Rogers (1967a) and Havelock (1969a) indicate that a highly developed organizational hierarchy impedes communication necessary for diffusion. Griffiths (1964) forthrightly states that: ". . . the more hierarchical the structure of an organization, the less the possibility of change" (p. 434). On the other hand, Sapolsky (1967) concludes that the decentralized structure of the department store may serve as a major barrier to the institution of change. When interunit communication is good in such an organization, it allows for mobilization of forces against the tactics used to reduce resistance. Still another study reported that, possibly because adoption entails less risk than innovation, teachers in schools with a diffuse social structure *innovated* more, while those in a hierarchical *structure* adopted more (Lippitt et al., 1967). (To be sure, some changes may have foreseeable undesirable consequences, and *should* be resisted.)

Barnes (1969), after pointing out that there are four main variables in an organizational change (the task, the technology, the people, and the structure), notes that differences in power distribution can affect how changes can be initiated and implemented. Two typologies of change style are presented. These approaches differ with regard to unilateral power versus mutually shared power. Although the former approach is more prevalent in industry, a survey shows increasing emphasis on the value of shared power. Or, as Maier (1963) has expressed it, ED = QxA (an Effective Decision equals its Quality times Acceptance by those required to implement it).

H. Davis (1973) offers advice concerning a balanced attitude toward the use of power on the part of the mental health administrator faced with the need to induce organizational change commensu-

rate with the increasing tempo of societal and individual change. He points to the assumption made by some administrators that using power, authority, or money is easier than employing what might seem to be more tedious change management techniques. Simplistic adherence to this viewpoint, however, often has resulted in false economy. On the other hand, he asserts, the belief that a sufficiently worthy innovation will naturally be adopted on its own merits fails to take into account the hidden jungle of conflicting personal motives that can subvert even the most promising innovation.

Bureaucratic structure. V. Thompson (1965, 1969) makes the point that modern bureaucratic organizations, theoretically considered, are intrinsically resistant to innovation because they are monocratic, stress conformity rather than creativity, and are conservative in orientation. He believes that the bureaucratic structure is slowly evolving in the direction of greater flexibility. He suggests that this trend toward flexibility could be accelerated by looser structure, freer communications, decentralization, greater reliance on group processes, and modification of the incentive system (stressing the internal rewards of gratification rather than such external rewards as upward movement in the hierarchy).

Bennis (1971) basically agrees with Thompson, believing that the bureaucratic form of organization is out of joint with contemporary realities and that drastic changes in the conduct of corporations and managerial practices are necessary. He argues that managerial goals should be integrated with individual needs, and sources of power redistributed. Bennis predicts that the bureaucratic structure of organizations will be replaced by adaptive, problem-solving temporary structures with diverse specialists linked together by coordinating and task-performance-evaluating professionals.

According to Abbott (1965), there exists in education a hierarchical bureaucratic structure that makes it difficult to decide when new programs are needed and inhibits their generation. This structure tends to undermine the development of the teaching role. In order to produce a more innovative educational structure it will be necessary to alter the traditional hierarchical organization, wherein the status of the administrative personnel is elevated above that of the teachers.

In analyzing the often overlooked consideration of "depth of change" Downs (1967) recognizes four "organizational layers": (a) specific actions taken by the bureau; (b) the decision-making rules it uses; (c) the institutional structure it uses to make those rules; and (d) its general purposes. Downs has set down over 180 propositions or hypotheses regarding the life cycle, characteristics, officials, communication patterns, control problems and processes, search and change mechanisms, and other ideological factors in the operation of bureaucracies. Many of Downs' principles and hypotheses have a bearing on innovation and change in organizations.

In a June 1975 conference sponsored by the Human Interaction Research Institute on "Planning for Change in State Hospitals," one of the subjects that surfaced was that in connection with state hospitals, the bureaucratic machinery is the principal conduit through which the more fundamental change programs must pass. Therefore, a question that came into focus was how best to deal with state bureaucracies in ways most likely to contribute to successful change. One view offered was the virtue of a cooperative stance oriented to working *with* the bureaucracy. Another was an adversary stance oriented to working *around* the bureaucracy. A third and most generally accepted view at the conference was that working with the bureaucracy may be the most appropriate strategy under given conditions, while subverting it may be the most appropriate under other conditions, and the change agent's objective should be to identify the conditions under which one or another strategy is the most effective.

Another subject that came into focus at the conference was a discussion of the efficacy, stated in oversimplified terms, of authoritarian versus participative leadership styles in the management of change programming. There was a good deal of consensus among the conferees based upon first-hand experience that what works best in promoting effective change is likely to be a function of the hospital's "level of development." As one conferee put it:

> If you have an organization of open-minded rational people, you can start your change program with problem identification in which everyone participates; but if your organization has not achieved that level, if you are dealing with people who are suspicious, not very sensitive, punitive, not very competent, rigid, you cannot start at the level of changing procedures but must start further back—changing attitudes—and sometimes be sneaky in the process . . . . In our hospital, at a given stage, if we had allowed people to ventilate resistance we would have spent years making minor changes. . . . There was a time at our hospital when staff beat up patients, and one

> was killed. I think the only way we could have dealt with that situation was by fiat. . . . At a later time, so many people were trying to make changes that they were cancelling each other out. We had to insist on consensus decision-making with a group of 14 or 15 program directors. In short, what works best is likely to depend on the state of development.

One additional aspect of democratization that was explored was the opportunity for getting patients more meaningfully involved as agents in the change process than had generally been the case heretofore:

> Somebody decided we should let patients write in their own charts. This had the effect of upgrading the progress notes enormously, because they would write all kinds of nasty things and the staff would have to account for that with another note to cover themselves. That worked so well we decided to let patients read their own charts. That again upgraded services more than our staff development program ever did. If the staff wrote "paranoid reaction based on latent homosexualty," the patient would write "bullshit." So people started writing in English. Then, since we had a problem-oriented medical records, we decided people should enter their own problems. They entered really "inappropriate" problems like "I don't have money, or a job, or a high school diploma." This had the effect of increasing enormously the referrals to Vocational Rehabilitation . . . employment services, etc. I think there is something to direct involvement of the consumer—I'm not sure it does a great deal of good for the consumer directly, but what it does is upgrade the staff. The point is, there really are some concrete mechanisms and change processes in which you can involve the patient as change agent.

Occupational specialization. Another factor of the organizational structure that appears related to innovation is that of occupational specialization. A study of vocational rehabilitation agencies, for example, determined that there was a high positive correlation between the rate of acceptance and implementation of new programs and the number of occupational specialties within the organization (Aiken & Hage, 1968). Moreover, the number of occupational specialties was one of the best predictors of future program innovation. Similarly, a study of medical schools found that innovative schools had a larger number of departments in the basic sciences and clinical areas (Carrole, 1967). According to these studies, such intraorganizational diversity appears to foster creative exchange among staff.

Contrariwise, however, Havelock (1969a) considers division of labor (specialization) to impede communication between organizational subunits in three ways: It fosters the formation of unique coding schemes, it stimulates interunit competition, and it encourages the formation of separate and incompatible group norms. A key factor in determining the effects of specialization might be that of the extent to which specialized organizational subunits are autonomous or interdependent. Thus, the Carrole (1967) study found that the innovative medical schools reflected a lessening of the traditional departmental autonomy. The fading of departmental autonomy was attributed to shift from the allocation of funds to departments, to allocation to the broader school unit. Similarly, the agencies in the Aiken and Hage (1968) study that had a high number of different occupational specialties and were the most innovative, were also those most likely to have many cooperative relationships with other agencies. This might suggest that the focus of staff was on professional or organizational goals rather than departmental self-interests. In a later study (1970) Hage and Aiken pointed out that organizational complexity and emphasis on job satisfaction were positively correlated with a *high* rate of change; centralization, formalization, stratification, and concern with volume production and efficiency were positively correlated with a *low* rate of change. (One should not assume here that high rate of change is necessarily better or more productive than low rate. High rate may make for instability and inefficiency in some situations.)

Viewed from another angle, the matter of occupational specialization ties in with the experimental socio-technical system such as has been sponsored by the Tavistock Institute in England whereby relatively small work groups are given responsibility for relatively large tasks. In the socio-technical system there is emphasis on optimizing the social (human) and mechanical components of work systems to enhance both. One such experiment entailing the redistribution of specialized jobs in a loom weaving factory in India is reported as successful by A. Rice (1971). In Norway, Thorsrud (1968) describes several equally successful experiments in the regrouping of job activities and skills involving increased responsibility (job enrichment and job enlargement by smaller, more autonomous work groups) by less-supervised workers. "Successful" in this context is defined in terms of greater job satisfaction *and*

greater productivity. Glaser (1976) has summarized many such experiments in the U.S., Europe, and Japan.

Size, affluence, and capacity. In spite of the popularly held assumption that larger organizations are slow and cumbersome in changing, evidence indicates that more change actually takes place in larger organizations. For example, Carrole (1967) found that larger medical schools were more innovative. Mansfield (1963b), in a study of 294 industrial firms, found that when profitability was held constant, the chances were good that a large firm would be quicker to use a new technique than a small firm. In a later study (1968), he suggests that the largest organizations will do a disproportionately large share of the innovating under the following conditions: (a) when the investment required to innovate is large relative to the size of the organization that could use the innovation; (b) when the minimum size of the organization required to use the innovation is large relative to the average size of similar organizations; and (c) when the average size of the largest organizations is much greater than the average size of all potential users of the innovation.

Schon (1967) notes that innovation within the textile industry is quite limited because the individual firms are too small to support research and development; consequently, new developments come from outside the industry, i.e., from related feeder industries such as chemicals.

Generally it would seem logical that the more successful, internally secure, and financially prosperous organization would be in a better position to risk innovation. Havelock (1969a) refers to this as a "capacity factor." Several studies have related organizational affluence to innovativeness (Richland, 1965; W. McClelland, 1968b). The findings of Mansfield's (1963b) extensive empirical investigation of industrial firms, however, cast serious doubt on the certainty of this relationship. In his study of 294 organizations, it was found that a firm's financial health as measured by profitability, liquidity, and growth rate, bears no close relationship to how long it waits before introducing a new technique. Havelock (1969a) makes note of this ambiguity in the findings related to the variable of organizational affluence and makes the following suggestion:

> It seems reasonable to suppose that two conflicting forces in organizational dynamics are operating against each other to produce these confusing results. On the one hand we have the complacency factor . . . as an "inhibitor" when organizations see themselves as functioning at a high level already. The other is the "risk capital" factor which also comes into play as a force *for* innovation when organizations are functioning at a high level. Which of these opposing forces is dominant in a given situation probably is determined by additional factors such as attitude and structure . . .

Organizational inertia. This is the characteristic that has given large organizations a "bad name" with regard to organizational size and innovation. Actually, organizational inertia, which might in part result from an institutional hardening of the arteries, appears to be largely a function of the age of the organization and failure to deliberately encourage a spirit of self-renewing challenge from its own staff and from those it serves. Large institutions appear most susceptible to this condition. Over a period of time, procedures, regulations, activities, and attitudes become routine, habitual, and cemented (Glaser, 1965; Havelock, 1969a).

Guest (1962) points out that the length of time required for an organization to improve its performance as it moves from one pattern of behavior to another is a function of. (a) its size in terms of number of staff; (b) the number of specialized service, reporting, and control groups; (c) the number of levels in the hierarchy; (d) the complexity of technical operations; and (e) the intensity of personal insecurity and interpersonal hostility.

The bringing in of new blood may be significant in achieving innovation, as is illustrated in the case of the National Teachers Corps, where the conventional organization was "invaded by liberal, creative, and unconventional outsiders with fresh perspectives" (Corwin, 1972).

Complex organizations are described by Hage and Aiken (1970) as having a pervasive static or dynamic "style" reflecting the distinction between the "mechanical" and the "organic" models commonly used in the sociology of organizations. Inertia may be viewed as a manifestation of static style ordinarily related to an overall static environment.

Schon (1967) sees the corporation as caught in a dramatic ambivalence regarding innovation. At the same time, the social system within the corporation attempts to maintain a stable state while under pressure for technical change that might be destructive of the stable state. Internal dissension between the R&D and the marketing arms of the corporation often reflects this ambivalent condition. This conflict tends to reduce innovation.

Self-renewal. A characteristic related to organizational structure is the concept of organizational

self-renewal, or the organization's adaptability to our rapidly changing world. The concept of self-renewing institutions builds on the idea of pluralism; each such organization is "characterized by variety, alternatives, choice, and multiple foci of power and initiative" (Gardner, 1964). Instead of blaming outside factors—science, technology, or the Establishment—for lack of change, Gardner asserts that we must learn to "organize for freedom," that is, design and build organizations that help individuals to develop themselves.

Self-renewing organizations provide structures for sensing internal and external changes which call for creation of new procedures (Watson, 1973). Miles (1965) identifies a similar characteristic as a dimension of the healthy organization which he terms "problem-solving adequacy." This includes structures and procedures for detecting problems, inventing possible solutions, choosing solutions, implementing them and evaluating their effectiveness. This may take the form of an office for research and development; or a setup for problem sensing, such as an ombudsman, or interview survey, or a regular consultant service. The absence in an agency of any unit that is designed especially to detect internal trouble before it becomes serious, and external trends before they become generally evident, makes it unlikely that the organization will succeed in continuous self-renewal. It can only alternate between costly lag and overdue spurts of reorganization.

Related to self-renewal is self-examination. H. Davis (1972) found that organizations which carry out program evaluation tend to be more innovative than those which do not. On the other hand, Havelock and Havelock (1973b) found a slight negative relationship between emphasis on evaluation and number of reported innovations in U.S. school districts.

In a study in which the focus was explicitly the mental health service delivery agency, Glaser and Ross (1971) formulated a set of operating conditions that would provide an organizational vehicle for effecting change: carrying out periodic reviews of agency mission, assessing program effectiveness, disseminating knowledge about promising alternative practices for carrying out various types of functions, providing opportunity for advocacy, providing a means for input to decision making by all concerned insofar as practicable, providing a way of sustaining commitment, having control over sufficient resources. These conditions can be considered functions of organizational climate and goals as well as structure.

Miscellaneous factors. A number of other factors directly or indirectly related to organization have been studied in relation to innovation and change. For example, in a survey of several hundred school districts, Havelock (1973a), found a number of variables to have a low but statistically significant correlation with an index of school district innovativeness, notably: the number of pupils, per-pupil expenditure, the utilization of media specialists and centers, in-service training, the utilization of lay advisory groups, the frequency of teacher strikes, and student unrest. (The last five variables might well constitute "pressure forces" which in turn lead to responsive change by the school district.)

The Institute for Development of Educational Activities (I/D/E/A), in its 1970 annual report, addressed itself to problems of inducing change by setting up demonstration schools rather than working for reform within the school system. The problems in the latter case are considered at least as formidable as those of developing an alternative educational program. In either case, however, the school and the school system need to be viewed as social systems in which the introduction of isolated new programs, curriculum packages, changes in time and scheduling, etc., are vitiated without comprehensive changes in other aspects of the total system. Further, successful programs tend to have considerable autonomy, to have entailed a long-term financial stake, to have employed a widely spread expenditure of energy, and to have developed a local constituency of parents, students, teachers, administrators, and community members.

ORGANIZATIONAL COMMUNICATION AND DECISION MAKING

An organizational climate that supports the concept of self-challenge in a quest for renewal, and rewards the contribution of new ideas is conducive to successful innovation. Marcum (1968), for example, compared the organizational climates of high- and low-innovating schools and found that the schools involved in innovating showed more open climates. Numerous others affirm and confirm this principle (McGregor, 1960; Likert, 1961; Costello & Zalkind, 1963; Miles, 1964c, 1964d; Schein & Bennis, 1965; Schoenfeld, 1965; Watson & Glaser, 1965; Bennis, 1966; Julian, 1966; Cawleti, 1967; Chesler & Fox, 1967; Glaser et al., 1967, Greiner, 1967; Watson, 1967a; Schmuck, 1968; Glaser & Taylor, 1969).

Several features of organizational climate conducive to open-minded consideration of ideas for change relate to communication and decision making.

Open communication. An essential ingredient of a healthy climate for change is free communication, of both a formal and informal nature, flowing up and down the hierarchical lines and horizontally among colleagues (Costello & Zalkind, 1963; Dykens, Hyde, Orzack, & York, 1964; Miles, 1965; Becker & Stafford, 1967; Chesler & Fox, 1967; Evan & Black, 1967; Marcum, 1968).

Paisley (1969) draws attention to the fact that public health and education are unique in having stratified audiences for information, i.e., different kinds of experts at many levels, thus contributing to the difficulty of vertical communication.

Survey feedback, a special form of communication (discussed e.g., by Mann, 1971), involves systematically reporting results of surveys of employee and management attitudes and perceptions on such issues as employee-management relations and work conditions. The feedback system was found to be a highly effective method for increasing understanding and communication between employees and for modifying supervisory behavior.

A process of survey feedback wherein a client system examines data about itself is analyzed by Miles, Hornstein, Calder, Callahan, and Schiavo (1971). They found that meetings to consider such data with a view toward making and implementing action decisions have the effect of encouraging new behaviors and developing norms that facilitate productive work.

Gross, Giacquinta, and Bernstein (1971) report on an educational change study in which staff were highly motivated to attempt implementation of a "catalytic role model" by which teachers were to become less directive. A major reason for unsuccessful results (at least during an initial period of several months) was the failure to establish and use feedback mechanisms to uncover barriers to change that arose during the attempted implementation, according to the authors. Also responsible was the director's failure to bring into the open the several types of difficulty the teachers were likely to encounter in the ghetto elementary school in which the experiment was conducted.

Dykens et al. (1964), while advocating the importance of informal channels of communication, point out that a system of informal exchanges among staff is probably by itself unlikely in any systematic or important way to either generate change or compel interest in change; nor, they maintain, is it by itself likely to encourage creativity in thinking about long-range, complex, and demanding goals. Informality would seem to be adaptive rather than stimulating. R. Lippitt et al. (1967) mention a variable related to communication which may be critical: organizational norms must support asking for and giving help. Thus, not only is the quantity, form, and direction of communication important, but the content must relate to the desired goals of problem solving in order for the organizational climate to be conducive to change.

Administrative and colleague support. An administrative system of rewards or sanctions that motivate problem-solving efforts should exist, point out Costello and Zalkind (1963), who describe the administrator as a reinforcement agent. They state that positive reinforcement of correct responses is essential and recommend that the administrator place emphasis on intrinsic reinforcements such as salary and fringe benefits. R. Lippitt, Benne, and Havelock (1966) found that teachers who perceive a principal as supporting innovation did, in fact, innovate more often. That the perception of administrative support is related to supportive activity (not just words) is also suggested by this same study which found that more than one-third of the teachers who viewed the principal as bringing educational literature to their attention adopted new practices, while those who viewed him as never bringing such literature to their attention did not adopt new classroom practices.

The attitude of colleagues toward change can exert a strong force that inhibits or facilitates innovativeness within an organization. Chesler and Fox (1967), for example, point out that new teachers in a system, fresh from college or advanced training, may enter a school eager to try new ways only to be blocked by an established culture dominated by older teachers who do not welcome the suggestions. R. Lippitt et al. (1967) found that teachers who perceived colleague support in adoption efforts were more likely themselves to be adopters of new practices.

Participation in decision making. Extensive participation by all persons concerned in the identification and solution of organizational problems is conducive to change (Watson & Glaser, 1965; Chesler & Fox, 1967; Aiken & Hage, 1968; Glaser & Ross, 1971). On the other hand, rigid, authoritarian structures and coercive controls reduce trust and retard innovation. Forced or authoritative decisions are more likely to be circumvented and/or discontinued; group decision making is a longer process, but is more likely to result in lasting change (E. Rogers, 1967a). Coch and French (1948) conducted a classic experiment on this thesis which involved the introduction of a changed product in a textile factory. Later replication supported the conclusion that the greater the involvement of workers in planning the

coming change, the better their acceptance of it (French, 1960; Marrow, 1969).

Dykens et al. (1964) in a study of strategies of mental health change conclude that mutual participation in change efforts may lead to positive and constructive feelings and can further enthusiasm for change.

A follow-up study after four years of a two-year organizational change program in a company that shifted from a highly centralized, authoritarian system toward a participation system (Seashore & Bowers, 1970) revealed an evidently continuing progression toward the participative pattern, accompanied by an increase in profitability. Suggested explanations for the success of the program included the thesis that reasonable assumptions about values and motives of individual workers were taken into account in making structural changes in the organization, thus "locking in" the central characteristics of the system.

In an earlier work, a change program initiated when a successful manufacturer acquired a less successful competitor is reported by Marrow, Bowers, and Seashore (1967). Changes introduced cut across organizational structure, policies, work methods and technology, and included the building of a new organizational climate with the introduction of participative management at all levels. The treatise carefully documents how applied behavioral science brought about change and provides a comparative study of the effects of two differing managerial styles on human behavior and task performance. As noted earlier, participation by workers in decision making is exemplified in the "sociotechnical" experiments conducted in Norway by a committee of workers, management, and government (Thorsrud, 1968). These experiments lessened supervision by foremen and increased worker responsibility through small group operation on larger-scale tasks.

More effective decision making among supervisors results from multiple role-playing experiences as distinguished from ordinary role playing, according to Maier and Zerfoss (1971). In their experiment with what they termed multiple role playing, that is, entailing multiple groups, a large group of supervisory personnel was divided into small groups of six members, each with an additional reporting observer. One member acted as a foreman; the remaining members, as truck repairmen. The problem used in the session described had to do with the best way of assigning a new truck. A solution that involved the exchanging of trucks among the workers was considered to be the best type of solution. This approach to the problem tended to occur when the leader in the discussion group was permissive. The authors conclude that the multiple, small-group form of role playing, when followed by a discussion in the larger group, reduces embarrassment, widens participation, and results in better decision making.

Although studies indicate that in most situations wide participation in decision making is preferable, Watson and Glaser (1965) suggest that the judicious use of executive or administrative power can be successful in what is referred to as the *"fait accompli"*. This can be considered suitable when an authoritative decision is needed to overcome emotional rather than rational resistance to a change. An example cited is President Truman's order to integrate personnel in the Armed Forces and to open advancement opportunities for qualified members of minority groups.

But enforced changes can backfire. Sometimes, the greater the push, the stronger the opposition pull, as Marmor, Bernard, and Ottenberg (1960) observe. Enforced change can succeed only when opposition is relatively weak compared to the strength of the promoters.

ORGANIZATIONAL LEADERSHIP AND STAFF

Many studies have dealt with the role of organizational leadership and staff in the achievement of productively innovative performance.

The personality and role of leaders. Mansfield (1963b, 1968), after extensive studies of innovation among industrial firms, suggests that "the personality attributes, interests, training, and other characteristics of top and middle management may play a very important role in determining how quickly a firm introduces an innovation." The same is true of knowledge dissemination, according to Havelock (1969a) and Glaser (1973).

In studying a plant in which successful change occurred, Guest (1962) placed considerable stress on the role of a new manager, since in this instance the formal structure of the plant and a number of other features remained unchanged. Based on his experience in studying this plant and on his review of the literature, Guest concluded that: (a) the head of an organization should induce all concerned to focus on organizational requirements rather than personal requirements of the head man; (b) the achievement of goals requires an interdependence between the leader and subordinates; (c) to achieve results, the leader has to integrate other needs of subordinates with the requirements of top management; (d) the leader's authority needs to be exer-

cised in playing the dual role of the group's representative to higher management, and higher management's representative to the group; (e) he should be aware of and utilize horizontal as well as vertical communication; (f) he should encourage the enlargement of his own "span of cognition" as well as that of subordinates; and (g) he should encourage the generation of many decisions from the interaction of primary groups within the organization.

Whether the *manager* or the *organization* should be the primary target for change is the subject of an article by Burke and Schmidt (1971). While comparing the respective difficulties and characteristics of the two thrusts, the authors stress the reciprocal relation between the two, and the importance of attending to both the manager and the organization.

The context in which a leader functions is further considered by Rubin et al. (1974), who comment that the leader's role as an innovator may be circumscribed by various conventions and circumstances. Thus, the role of administration in a community health center may be influenced by the fact that the administrator, if he is not a physician, may be subordinated to an M.D. with set views. Feedback is usually limited to responses of individual patients who are not likely to be aware of larger-scale organizational matters. Moreover, in such agencies the bringing out into the open of any existing conflicts is seldom good politics or an effective way of raising needed funds.

Although the characteristics of organizational leaders appear to significantly influence organizational innovation, it is perhaps erroneous to regard the "innovativeness" of an official as only a matter of his own personal traits. He occupies a certain position in a system, and is expected to act the corresponding role (Sieber, 1968). He is subject to sanctions for unacceptable deviations (Rubin et al., 1974). He is required to be a functionary. L. Carter (1968a) observes that all too often the "gatekeeper" of change in educational and other social institutions is politically rather than professionally oriented. That he must be alert to shifting pressures, but not necessarily to research findings, would seem to follow.

In any hierarchical organization subordinates become highly sensitive to the values and preferences of persons in higher positions. E. Rogers (1962a) asserts that "the rate of collective innovation is positively related to the degree of power concentration in a system." In any case, support by top leadership will be a strong factor in bringing about change (Likert & Lippitt, 1953; Flanagan, 1961; Glock, 1961; Mansfield, 1963a; Richland, 1965; Sieber, 1968).

If there is a sensing unit to report emerging needs for change, the critical question then becomes the relationship of this intelligence service to the responsible decision makers who are the gatekeepers of innovation (Glock, 1961; Paisley, 1968). If the gatekeepers of innovation (often top management of the organization) truly provide a nondefensive climate which encourages and rewards challenge from within, and at all levels, then essentially all members of the organization are encouraged to become sensing units, and further, to participate in developing responses to identified problems or needs (Glaser, 1969).

Glaser and Ross (1971), aware of the need for internal advocacy to overcome barriers, note that adoption strategy should be designed with the creation of internal advocacy in mind. Effective innovation is seen as involving intervention by leaders who focus staff attention on agency problems, stimulate initiative, support risk-taking and experimentation, and provide recognition of innovative staff members. In formulating innovation and utilization strategies, the inclusion of leaders skilled in these practices is an important consideration. Along with effective internal leadership, championship and support by an outside change agent or knowledge specialist is helpful (Fairweather et al., 1974). The combination of innovative leadership involving outside and inside personnel was found to be the leading factor in a list of factors studied by Corwin (1972) in conjunction with a review of 10 Teacher Corps programs in urban and rural areas.

The significance of the role of opinion leaders in furthering innovation is treated in a number of studies, including for example, Becker (1970a), who investigated ways of identifying such leaders through the use of questionnaires and a long follow-up telephone interview.

Andrews and Farris (1967) report the results of two analyses exploring the relationship between supervisory practices and scientific performance. The findings suggest that the supervisor may play an important role in enhancing or depressing innovation. Greatest innovation occurred under supervisors who knew the technical details of their subordinates' work, who could critically evaluate that work, and who could influence work goals. If a supervisor's technical competence has become obsolete or if less favorable conditions surround the work situation, the data suggest providing substantial freedom to subordinates. Further, freeing

supervisors from responsibilities in the human relations and administrative areas may enhance innovation.

Waxing philosophical, Schon (1967) contrasts attitudes toward change held since the time of the ancient Greeks. He compares the "stable reality" view of Parmenides with the "reality is change" view of Heraclitus. Schon favors the idea that only change is constant. The distinction has a bearing on leadership attitudes. Only by seeing innovation as an adaptive way of life, he maintains, can we cope with our rapidly changing environment, and leaders should be wedded to this idea.

Tenure and vested interests. Few reports were located on the debatable question of the relationship of tenure to innovativeness. In a theoretical discussion, Griffiths (1964) sets forth the proposition that "the number of innovations is inversely proportional to the tenure of the chief administrator" in an organization. He also asserts that "change in an organization is more probable if the successor to the chief administrator is from outside the organization than if he is from the inside."

Strong vested interests obviously can constitute powerful barriers to the introduction of change (Watson & Glaser, 1965; Glaser & Ross, 1971). A tendency to preserve the status quo in methods of operation, whether for psychological, economic, ideological, political, or other reasons, may be present at various levels within an organization.

Staff morale and cohesiveness. Several studies relate high staff morale to organizational innovativeness (Miles, 1965; Chesler & Fox, 1967; Aiken & Hage, 1968; Marcum, 1968; Glaser & Ross, 1971). Actually, high morale would appear to be another effect of the same factors noted above which facilitate organizational innovativeness. Level of staff morale, then, might serve as a good indicator of organizational climate.

Staff cohesiveness appears positively related to innovative organizations (Miles, 1965). Like high staff morale, this characteristic would seem to be a product of a positive organizational climate.

Miles et al. (1971) in a study of survey feedback meetings of "family work groups" also found that the resultant interaction increased liking for one another among the interacting parties, and at the same time, increased pressure for conformity to group norms. Physical and social distance between members and subunits of an organization and between sources of innovation and potential adopters impedes innovation and diffusion (R. Lippitt et al., 1967; E. Rogers, 1967a; Havelock, 1969a).

A qualifying consideration is the finding that satisfying social relations among staff may operate against change and is characteristic of a "closed" organizational climate (Aiken & Hage, 1968; Marcum, 1968).

As even this brief reference to the relation of interpersonal considerations to change potential may suggest, behavior is likely to be influenced in subtle ways by social relationships. Although generalizations may not be in order, an indirectly confirming study by Mann (1971) notes that classroom-type training in human relations does not assure translation of such learning to job performance, and, in the situation studied, had little effect on the behavior of plant foremen. Related to this is the observation by Fairweather (1973; Fairweather et al., 1974) that change-oriented attitudes do not necessarily result in change-oriented behavior.

Professional qualities. The characteristic of staff professionalism appears to be positively related to organizational innovativeness. To illustrate, a survey of a sample of the most and least innovative schools from five states found that the most innovative showed the larger number of professional staff (Marcum, 1968). E. Rogers (1967a) suggests that the professionalism of potential adopters is an important influence on diffusion of innovation. An interesting twist is suggested by a study of organizational factors affecting the success of innovative staff proposals submitted to line management in business organizations. Among the characteristics of organizations in which proposals were more likely to be successful were: (1) a higher degree of professionalization of staff personnel, and (2) a lower degree of professionalization of management (Evan & Black, 1967).

Havelock (1969a) indicates that the main effect of professionalism of staff is the entry or input of new knowledge into the organization. Further support for this idea is provided by Aiken and Hage (1968). These investigators found that the amount of extra-organizational professional activity was highly and positively correlated with organizational rate of new program implementation. Amount of professional training, in itself, however, did not appear significantly associated with rate of innovation.

Regarding commitment to innovative practice, professional attitudes appear to be somewhat complicated, as a study by R. Lippitt and Fox (1967) discovered. When a group of teachers was sent a catalogue of thirty carefully selected "promising practices" and asked to respond to the catalogue by postcard indicating the suggested practices they

planned to use, the response was quite poor, both in the number returning the postcard and, among those who did, in the indication of practices that would be tried. However, when a "sharing institute" was held in which the practices were discussed via lectures and small group sessions, the response was much more favorable.

In a similar situation, growing out of an R&D experiment in the Northwest, an attempt was made to encourage directors of sheltered workshops to consider the adoption of a very successful innovative practice for rehabilitation of the adult mentally retarded. When the set and setting became one where each person was invited to serve in the role of teacher as well as learner—where each participant could receive ego rewards as a contributor of promising new practices as well as a student—there was demonstrably greater readiness seriously to consider the ideas of others (Glaser et al., 1967).

A further treatment of professional considerations will be found in the section on personal variables.

Multiple factors affecting staff. The literature calls attention to a number of additional staff factors. For example, sufficient time should be provided for problem solving and change-related activities. In order to create an organizational climate conducive to innovation and change, staff must have some time free from the pressures of routine in which to engage in communication, problem solving, or pursuit of research input (Costello & Zalkind, 1963; Dykens et al., 1964; R. Lippitt et al., 1967; Marcum, 1968).

Staff who operate in organizations in which there have been changes are more open to further change (Bright, 1964). This seems particularly true when subsequent innovations are closely related to those preceding (Sapolsky, 1967). Innovations seem to come in clusters (Little, 1963). On the other hand Mansfield (1963b) found that a firm that is a leader in introducing one innovation may be slow to introduce the next.

Organizational forces are patently interactive. Glaser (1973) comments on the interplay of such factors as: a leadership open to change; outside pressures for change; aroused will to change in response to crises; information feedback that stimulates desire for goal attainment; incentive systems; organizational rearrangements; shared interest in learning and problem solving; and even the increased readiness for change born of boredom or discontent with current commitments.

Argyris (1965) stresses the importance of interpersonal competence for effective innovation and problem solving in organizations. Results of studies made by questionnaires, interviews, and problem-solving meetings are outlined. A model of probable relationship between interpersonal competence, internal organization, and innovation is proposed.

In the previously mentioned study by Fairweather et al. (1974), among the factors serving to facilitate adoption of a "lodge" program were: (1) nonpassive (in fact, aggressively active) presentation of the new idea, such as through demonstration projects, (2) small change-oriented groups within the organization, fortified with the assistance of outside change agents, and (3) organizations where many people made the decisions rather than only a few at the top.

Personal Variables

Miscellaneous studies have touched on a number of personal characteristics of an individual that may be related to his responses with respect to new ideas and procedures.

AGE

Several studies (e.g., E. Rogers, 1962a) report that younger people are more attracted by innovation than are their elders. The stereotype of senior citizens is that they believe in the good old days. Marcum (1968) found younger educators in the more innovative schools; R. Lippitt et al. (1967), however, report more response to innovative proposals from older as well as younger teachers, with the middle range most tradition minded.

ECONOMIC AND SOCIAL STATUS

Comparable to the "capacity factor" in organizations, an above-average economic status seems favorable to the innovative personality. Studies of revolution have shown that leadership does not come from the most deprived individuals, but from those already on their way up. Preoccupation with survival exhausts the energies of the very poor. E. Rogers (1962a) found that persons with higher social status and more education were more likely to learn of an innovation and to try it.

The fact that the National Teachers Corps (which was set up to train teachers for and improve the quality of education in low-income area schools) attracted young, liberal, and unconventional trainees outside the usual group of prospective teachers is said to have contributed to the innovativeness of the program (Corwin, 1972).

PROFESSIONAL CONSIDERATIONS

R. Lippett et al. (1960) found professionalism to affect innovation and diffusion, and pointed out that teachers with a high professional commitment

appear more willing to engage in discussions about their profession and professional activities than teachers who are not so highly committed.

Successfulness in one's work is like a coin, both sides of which must be examined. Although security is a prerequisite to accepting innovation, successful practitioners in any profession usually feel little need to change (LaPiere, 1965; Berlin, 1969). A man may be eager for innovative change because he has been unsuccessful in the status quo, but, more frequently, it is because his earlier innovative efforts have attracted attention and helped his upward mobility (LaPiere, 1965).

The successful scientist or professional tends to become an opinion leader, and hence exerts an influence on innovative adoption, as observed by M. Becker (1970a) in a study of public health officers.

"Cosmopoliteness," or orientation and contact outside a particular social system, is another characteristic of innovative persons (E. Katz, 1961; E. Rogers, 1962a; Marquis & Allen, 1966; M. Becker, 1970a). E. L. Thorndike once observed: "The mother of invention is not necessity; it is the knowledge of other people's inventions." Contact with a stimulating number and variety of persons and institutions provides a good background for conceiving fresh combinations. Coleman et al. (1966a, 1966b) found that earlier adopters of a new therapeutic drug were doctors who read more journals and went to more professional meetings. A similar point was made about school superintendents by Hemphill, Griffiths, and Fredericksen (1962). A study of university faculty found the pro-innovation faculty had taught at more institutions (Evans & Leppman, 1968).

R. Lippitt et al. (1967) and W. McClelland (1968b) both note that innovators are aware of more sources of information and are more familiar with research than non-innovators. It may be that the higher sense of personal security that tends to characterize innovators is in part based on a sense of knowledgeability.

Keeping up with the literature in one's field is evidently related to professional attitude. In a survey of some 3000 engineers and scientists, mainly for the purpose of determining the means by which scientists and engineers in industrial research and development acquire technical information useful in their work, Rosenbloom and Wolek (1970) found that those with a high degree of commitment to the job tended to pursue formal education and to use professional publications more often, and local sources of information less often, than the average respondent.

PSYCHOLOGICAL FACTORS

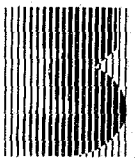
Halpin (1962) suggests that a high need for affiliation on the part of many teachers and school administrators acts as a barrier to change. Need-affiliation produces a desire for sameness or equality among practitioners, who are unwilling to be different for fear it will affect their status in the peer group. Innovators, on the other hand, appear to have a high need for achievement, according to D. McClelland (1969). They may often be regarded as deviates, or marginal, within their organization and less concerned with conformity to traditional patterns.

Programs for heightening a sense of personal security and an openness to ideas and for fostering personal and professional growth are often integral parts of research utilization strategies. R. Lippitt et al. (1967) emphasize that innovators initially are open to adapting and modifying practices. They are relatively nondefensive and are not afraid of evaluation or possible failure. They are low in dogmatism, and are oriented toward personal and professional growth.

Security is a factor closely related to the mood which favors creativity. When men feel anxious and threatened they tend to regress to past patterns of action associated with more security. Change easily seems threatening: even new information which disagrees with previous assumptions may be upsetting (Spicer, 1952; Marmor et al., 1960; Zander, 1962; Watson & Glaser, 1965; National Science Foundation, 1969). Most psychotherapists recognize that while patients remain fearful and anxious they cling to well-worn defenses. Only after they achieve a sense of security in the therapeutic relationship are they free to build new responses (e.g., C. Rogers, 1969a).

Referring to high achievement motive, D. McClelland (1969) describes the motive acquisition process in terms of input, intervening, and output variables. The input variables include reference group support, feedback on progress, personal and objective goal setting, building achievement-oriented conceptual networks and linking this network to reality, self and cultural values. Intervening variables are described in terms of characteristics of associative networks. Twelve propositions are detailed for implementing a developmental program based on outcome or dependent variables such as job improvement, use of time and money, nature of job and rewards, use of feedback, risk-taking, and achievement-associated concepts.

Viewing the problem of self-renewal on a grand scale, Gardner (1964) analyzes the individual as a source of change. He stresses commitments beyond oneself that presume an optimistic but not unrealistic attitude toward the future. Also emphasized is the need for a consensus of values in the society. He sees the productive individual as facing problems with moral seriousness, and insists that society must help him to find constructive outlets for his commitments.



STAGES IN THE PROCESS OF KNOWLEDGE UTILIZATION

Several behavioral scientists have outlined the phases of the change process within organizational settings. Several such outlines are presented in Table 2. Although there are differences in terminology, the parallels are substantial: nearly all begin with a need, a concern, a problem, a discrepancy between ideals and practice, or some other pressure; all move to diagnosis, analysis, or clarification; all recognize a need for obtaining pertinent knowledge and see a stage of creating and considering alternative courses of action; all describe an action or implementation phase; and all see a need for follow-through.

Others have set forth the stages or elements of the change process in relation to special considerations such as program adoption, problem solving, idea or knowledge utilization, message transmission, and project development.

Beal, Rogers, and Bohlen (1957) empirically validated the presence of the following five stages on the part of farmers in adopting the practice of feeding antibiotics to swine: (a) awareness; (b) infor-

TABLE 2
Stages of Successful Organizational Change

Author	Date	Concern: Awareness	Diagnosis: Knowledge Search	Consideration of Alternatives	Action: Implementation	Follow-through: Evaluation
Lippett et al.	1958	Need for change Get consultant	Clarification of problem	Examination of alternatives	Actual change	Stabilize
Jenkins	1962		Analyze	Determine	Make the change	Stabilize
Jung, Lippitt	1966	Identify concern	Diagnosis	Retrieve relevant knowledge Formulate alternatives Determine feasibility (tests)	Adopt the innovation	Diffusion
Watson	1967	Sensing problem	Diagnosing	Inventing possible solutions Comparing Weighing Deciding	Implementing	Evaluating Revising
Greiner	1967	Pressures Arousal Intervention Reorientation	Diagnosis	Specific problems Invention Commitment	Experiment	Search for results Reinforcement Acceptance
Rubin	1968		Diagnosis	Alternative Selection	Strategy situation Action Initiate Install	Support transition link to permanent system

mation; (c) application; (d) trial; and (e) adoption. Different sources of information were used in conjunction with the several stages. There was an average reported time lag of 1.54 years between awareness and adoption.

Zaltman et al. (1973) distinguish between the initiation stage and the implementation stage of the innovative process. They also suggest substages as follows:

1. Initiation stage:
   a. Knowledge-awareness substage.
   b. Formation of attitudes toward the innovation substage.
   c. Decision substage.
2. Implementation stage:
   a. Initial implementation substage.
   b. Continued-sustained implementation substage.

In relating information search to decision making and change in governmental bureaus, Downs (1967) asserts that a decision maker generating a new nonprogrammed action goes through the following steps: (a) perception of new information; (b) assimilation; (c) performance assessment; (d) formulation of alternatives; (e) analysis of alternatives; (f) evaluation of alternatives; (g) strategy formulation; (h) action selection; (i) continuous data acquisition; (j) action impact; (k) action feedback; (l) assimilation of feedback; and (m) performance assessment. The motivation to search for alternative actions arises from a significant discrepancy between what the bureau is doing and what it "ought" to be doing. Four classes of events are noted as causing "performance gaps" to arise in the eyes of the bureau members: (a) inevitable internal personnel turnover; (b) internal technical changes; (c) external environmental changes; and (d) repercussions of a bureau's performance or its functions, such as completion of a finite task or the discovery of something unexpected in a routine process.

Hage and Aiken (1970) envisage four stages of organizational change: (a) evaluation, in which the need for a new program is assessed; (b) initiation, management's decision to implement the program; (c) implementation, the actual carrying out of an innovation; and (d) routinization, the organization's attempt to stabilize the effects of the new program.

In an unpublished paper, Abelson (1964), building on Dewey's five-stage analysis of problem solving, has attempted to incorporate psychodynamic factors in the consideration of the five stages, designating them: (a) perplexity, (b) problem viewing, (c) solution seeking, (d) solution testing, and (e) resolution. Problems are seen as emerging from the matrix of daily living and as being resolved, for the time being at least, when the person "has had enough of the problem", and is ready to apply a chosen solution, or pseudosolution, either in a real life situation or simply in a mental rather than an actional context.

In conjunction with a study of teachers' responsiveness to psycho-educational ideas, Abelson (1970) analyzed the problem of transforming ideas into practice, noting the need to consider the following elements:

1. *The ideas themselves:* their soundness, validity, significance, relevance, realism, complexity, source of support, relation to other ideas.
2. *Communication and dissemination of the ideas:* complexity, precision, expansiveness in expression; generalizability; overtness, ease of practical illustration; manner of linguistic expression, style; form of publication; prestige of communicator.
3. *Educational or training modes:* the teaching or supervisory role of the transmitter; recipient roles; human and nonhuman media of communication; characteristics of the teacher and the learner; attitudes towards ideas, old and new; style of coping with learning tasks, curricular sequencing; preservice and in-service training; readiness and ability to translate ideas into behavior.
4. *Feasibility of executing the ideas:* sufficient time, money, effort, human resources; available logistics for delivery services embodying the ideas.

While not component stages of the idea-utilization progressions, these elements may serve as a checklist for examining the movement from idea to realization. In view of the complexity of the transformation process, the task of applied ideational innovation is viewed as requiring serious, long-range, programmatic planning.

Paisley (1969) distinguishes ten stages through which a message goes from the initial awareness that a message is being sent to the complete adoption of the ideas in the message following their trial and evaluation. These stages are enumerated in Chapter IV in the treatment of information retrieval and dissemination.

Glaser (1973) spells out "steps in the production process" that bear upon the likelihood of eventual successful transfer of promising grant-supported R&D findings. He organizes these steps under the following five headings: (a) writing the proposal; (b) negotiating the grant or contract; (c) carrying

out the project; (d) writing the final report; and (e) if warranted, carrying out postproject cross validation, replication, or diffusion activities. In Havelock (1974a), Glaser presents three checklists as practical aids in (a) the review of grant/contract applications or of research utilization proposals; (b) the application of criteria for potential adoption of an innovation; and (c) the consideration of change efforts through research utilization.

Studies relative to the several stages of the problem-solving and knowledge-utilization process are reported on in the sections that follow. While these sections pursue somewhat the scheme outlined in Table 2, the diversity of material found in the summarized literature required the sacrifice of a consistent, logical-stage approach for the advantage of covering potentially useful, although at times tangential, ideas.

Concern and Awareness of Need

One of the most frequently advocated principles regarding innovation and change is that in order for change to be successful it must be in response to a felt need (Spicer, 1952; E. Rogers, 1962a; Zander, 1962; Costello & Zalkind, 1963; Gallaher, 1965; R. Lippitt, 1965b; Watson & Glaser, 1965; Coe & Bernhill, 1967; R. Lippitt et al., 1967; Glaser & Taylor, 1969). R. Lippitt et al. (1958) identify three aspects of the development of a need for change: an awareness of the problem, a recognition that the condition might be improved as the result of change, and a willingness to seek outside help in bringing about the change.

Niehoff (1966) proposes that there are three types of felt need: (a) *solicited*—a need of which the recipients are fully aware to the extent that they solicit assistance from the change agent; (b) *demonstrated*—a need in which the recipients have demonstrated their interest to the extent that they have tried to solve their problem by their own efforts without outside assistance; (c) *ascertained*—a need which, although already existing when the change agent arrives, is only latent within the local social group and must be ascertained by both the innovator and the recipient. Thus, the change agent might have to foster or develop the awareness of need. Both administrators and practitioners must perceive a need. R. Lippitt et al. (1958) state that outside help must be viewed as meaningful. In terms of research utilization, practitioners may require persuasion in order to perceive research findings as potentially helpful.

The evidence is persuasive that to try to introduce new methods where there is no felt need is to court failure (Coe & Bernhill, 1967). Fairweather et al. (1974) stress the role that an outside agent and knowledge specialist can play in helping to nourish a sense of need for change. The best type of consultation is that which starts from the client's needs and which helps him to become an effective user of relevant R&D findings to meet those needs (R. Lippitt, 1962). The importance of practitioners' transmitting their problematic concerns to researchers is shown in the emphasis Havelock and Lingwood (1973) give to two sets of criteria they used in the critical analysis of four research and dissemination agencies. One set had to do with the agency's concern for developing the user's need awareness, self-sensing, and related qualities of problem sensitivity. The other set related to the definition, transmission, and transformation of user needs in such a manner as to further appropriate knowledge utilization.

The intriguing title, *Developing a Sensing Network for Information Needs in Education,* bespeaks the significance Paisley et al. (1972) ascribe to awareness of the concerns of practitioners. Five alternative methods of ascertaining information needs bearing on the educational process, educational content, and human variables were employed and analyzed by Paisley and his colleagues. The five procedures were as follows:

1. Statewide surveys in which questionnaires were distributed to personnel in selected school districts and state educational agencies.
2. A "follow-up" investigation in which educators who had requested information from central and local information centers were surveyed by means of questionnaires.
3. An "information specialists" study in which expert personnel of ERIC clearinghouses and local information centers attempted to project the needs of their clients.
4. A "hot-line" study in which educators across the country were invited to call a toll-free long distance number to request information.
5. An "educational serials topic trends" study in which the periodical literature of the field of education was monitored at four time points so as to detect changes in topic preference rankings.

With reference to the five procedures summarized above, the *statewide surveys,* the *follow-up study,* and the *information specialist study* showed high consistency in results. The *hot-line studies* and the *educational serials topic trends studies* tended to agree with one another (but to a lesser degree) in reflecting the nature of the infor-

mation needs across method of data collection and in respect to the characteristics of the respondents (teacher, principal, counselor, etc., on the one hand, and school level on the other).

Garner (1972) carries the problem of ascertaining the problems of users back further to the very initiation of scientific research. Garner believes that too many researchers, in focusing their interest on supposedly "pure" research, overlook the potentially stimulating effect of responsiveness to user problems. He seeks to break down what he regards as a false dichotomy between pure and applied research, noting that applied research also can have generic value. The same is true of serendipitous findings. In support of this position, he cites a number of instances in the field of experimental psychology where research, originally stimulated by here-and-now practical problems, has led to a resurgence of basic scientific development in related areas.

Some studies have revealed that the need for information sometimes is recognized only after the information has been encountered. For example, Rosenbloom and Wolek (1966), in a study of engineers, requested that the respondents identify a recent instance of technical information that they learned about from a source outside their immediate section or workgroup, and which proved valuable in their job. The study reports that in one-sixth of the instances where useful information had been received, the need for (or appreciation regarding the value of) that information was recognized only *after* it had been encountered.

Kelman (1962), in a pluralistic model of the use of research, emphasizes the process of internalization in which the user accepts influence because it facilitates what he himself wants to do, thus stressing the value of entering into the user's frame of reference as an important factor.

Trends in health care systems focus on specific needs which suggest the direction of possible innovation in that field. Beckhard (1974) lists the following trends that may reflect such needs:

1. An increasing concern with *total care* of the *total patient.*
2. A growing trend toward helping patients to manage their own health.
3. A growing number of health care activists.
4. Large segments of the population without adequate medical care.
5. New categories of health workers.
6. The family instead of the individual as the patient unit.
7. More delivery of primary health care by interdisciplinary teams.
8. Consideration of major curriculum revisions in medical education.
9. Greater opportunities for women and for minority groups in medicine.
10. New organizational patterns in health care schools.

Beckhard also presents illustrative problems as seen from different vantage points, i.e., by deans of medical schools, directors and faculties of other health schools, hospital administrators, community health center directors, and hospital interns and residents. He finds a "tremendous interest in the application of behavioral science and technology . . ." but has "also found tremendous suspicion and doubt about the practicality and relevance of this knowledge." The report reveals a flesh-and-blood picture of problems and perceptions of problems confronting the prospective innovator.

Although specifically concerned with the adoption process as applied to a mental hospital treatment innovation, Fairweather et al. (1974) also are interested in the current social problems that call for a more effective process of decision making than they consider to be in vogue. They urge the experimental tryout of model social programs as part of a new problem-solving social change mechanism, to be institutionally supported by centers for social innovation.

Diagnosis: Problem Clarification

In this phase, original perceptions concerning the problem are sharpened, relevant data are collected, the problem is redefined, and the organization takes a new look at it (R. Lippitt et al., 1958; Jenkins, 1962; Jung & Lippitt, 1966; Watson, 1967a; Greiner, 1967; Rubin, 1968). Several diagnostic possibilities are outlined by R. Lippitt (1962): (a) an inappropriate distribution of power, too diffuse or too centralized, (b) blockage and immobilization of productive energy, (c) lack of communication between the subparts of the system, (d) lack of correspondence between external reality and the situation as perceived by the organization, (e) lack of clarity or commitment to goals for action, (f) lack of decision-making and action-taking skills.

Halpert (1972) suggests that researchers and administrators should get together and think hard about the questions that need to be answered by research before the former conduct studies and the latter try to apply the resultant findings. Research workers often focus on answerable questions that are not relevant to the critical issues confronting program administrators. Program people are sometimes dazzled by the hardware of research and fail

to specify their real information needs. A number of writers (Havelock & Lingwood, 1973, for example) draw especial attention to the importance of transforming user needs into problem statements and researchable questions. In outlining the attributes of social innovative experiments, Fairweather (1971) indicates that besides defining the social problem speculatively, naturalist field observations should be made to describe its parameters in the actual community setting. In reading the account of innovations in Gabor (1970), it becomes evident that vitally important human problems or "side effect" problems are often hidden and frequently go unheeded in man's interactive rush to initiate change, to react to the consequences of change, and to adapt to changing circumstances.

Techniques may be employed within an organization to bring out into the open the way in which different categories of personnel perceive problems, or the issues implicit in them. The Q-sort procedure advocated by Jenks (1970) is a device that may be used for this purpose, along with other forms of problem identification. Technology assessment constitutes a systematic effort to foresee and take account of social consequences stemming from the introduction of new techniques (Coates, 1971).

Havelock (1973a) states that the change agent, after having established an appropriate relationship, must guide the client in making a diagnosis which involves identifying the problems, identifying the opportunities that are open, and insuring that the agent thoroughly understands the client's system. Common pitfalls of the diagnostic stage include: spending too much time on diagnosis; using destructive confrontation; imposing the change agent's favorite diagnosis; and responding to the client's pressure for a crash program.

Search for Pertinent Knowledge

In studying the methods and devices used by scientists and technologists in seeking information, Herner and Herner (1967) reviewed investigations of the subject that employed standard information-seeking media, namely: records, interviews, observation, questionnaires, and bibliographic techniques. They found a miscellany of facts concerning information seeking, as, for example:

1. Time and effort consumption discourages the use of certain means.
2. The larger the firm, the more formal the approaches employed.
3. Pure scientists are more dependent on the literature than are industrial scientists and technologists.
4. Researchers discover and identify useful publications outside the library (the most frequent question they put to reference librarians is whether the library has a given title).
5. Information flow within and without the laboratory is mediated by "gatekeepers", i.e., by persons to whom others most frequently turn for technical advice and consultation.

Patterns of information use by vocational-technical educators in seven job classifications were determined through a questionnaire survey by Magisos (1971). The educators were found to spend much time gathering information in their work, but not always efficiently. For example, few had been taught to use the Educational Resources Information Center (ERIC) properly, though it is better designed to serve their needs than other more widely used sources. Many vocational-technical educators have never received, requested, or used ERIC materials. These educators often prefer direct, personal contact with familiar and convenient sources of information.

Rosenbloom and Wolek (1970) found that scientists tend to make substantially more use than do engineers of sources outside the corporation in which they work. For industrial scientists, only about half the information gathered resulted from a specific search by the respondent. In nearly one-third of the cases, the information was acquired because someone pointed it out without being requested to do so. In about one-fifth of the cases, the respondent's intent in seeking information was to develop his general competence, rather than to acquire some particular knowledge. The authors conclude that "information looking for the man" is nearly as frequent as "man looking for information." It is an unfortunate but understandable commentary on human nature that in a crisis situation, a diligent search for pertinent research is seldom made (Havelock & Lingwood, 1973).

In his wide-ranging analysis of knowledge production and utilization, Short (1973) states that the knowledge utilization process involves the user's knowledge structure, his motivation, his estimate of the source's credibility, the social sanctions for or against use of the knowledge, the availability and appropriateness of the form of the knowledge, and the existence of linkage agents or systems. A detailed treatment of information retrieval, as well as its dissemination, will be found in Chapter IV.

Consideration of Alternative Solutions

In the matter of generating alternate solutions to problems, a solid background of knowledge is con-

sidered necessary along with qualities of open-mindedness and ingenuity. This stage of the process requires the translation of diagnostic data and insight into possible strategies of action, and selection of the most feasible strategy (R. Lippitt et al., 1958; Havelock, 1970).

Rogers and Svenning (1969) identify two steps which might be incorporated into this phase; (a) define, distinguish, and analyze the target decision and adoption audiences; and (b) define the steps that must be taken with each of these audiences to reach a decision, secure adoption, and achieve the objectives of change.

Rubin (1968) states that the selection of strategy is based on consideration of: (a) the kind of innovation being installed, (b) the characteristics of the organization, and (c) the individual engineering the change.

Varying degrees of objectivity have been recommended in assessing the comparative consequences of various courses of action. The optimization of the benefit/cost ratio, notably with regard to technological developments, has been a favorite approach of those who engage in technological assessment (H. Green, 1973).

The consideration of alternative solutions is obviously linked with the process of decision making, which in turn is tied in with experimental or other forms of evaluation as applied to proposed changes. In a monograph by Alkin, Kosecoff, Fitz-Gibbon, and Seligman (1974), the Center for the Study of Evaluation at the University of California at Los Angeles presents the results of an analysis of the variables related to the impact of evaluation on decision making as evidenced in the evaluation of 42 projects dealing with bilingual education that were sponsored by Title VII of the Elementary and Secondary Education Act. Much emphasis is placed on the distinction between formative and summative evaluation. In the former case the evaluative effort is designed to aid in decision making in the course of the development or application of the program under consideration; in the latter instance, only after the program has completed a stated experimental period.

It should be noted that the study of alternative solutions to current problems is becoming increasingly complex. The consequences of new knowledge and its accompanying technology are seen as entailing indirect, far-ranging, and future outcomes of often uncertain and sometimes potentially harmful significance to the physical environment and/or the welfare of individuals or society as a whole. The dilemma of rapid knowledge growth, once considered the epitome of progress, is presently being documented in an expanding literature on futurology and technology assessment. Thus, Bell (1973) analyzes the economic, social, and intellectual shifts that may be expected to occur with "the coming of the postindustrial society."

Governmental concern with the difficulties of decision making in a technologically expanding world is evidenced in the establishment of the Office of Technology Assessment of the Subcommittee on Science, Research, and Development of the Committee on Science and Astronautics of the U.S. House of Representatives, as described by Coates (1974). In an earlier article Coates (1971) presents a succinct account of the rationale and scope of technology assessment (this term includes social technologies), and presents an illuminating chart illustrating a series of first-to sixth-order consequences of three technological advances: the automobile, improved refrigeration, and television.

The spreading network of the consequences of technological developments, both physical and social, is made the subject of a penetrating analysis by Hetman (1973). Citing numerous references, including a highly pertinent set of papers presented at an international seminar on technology assessment conducted under the auspices of the Organization for Economic Cooperation and Development (1972), Hetman offers a highly systematic and detailed account of the premises, concepts, methodology, experiments, and areas of application of the subject of "society and the assessment of technology." He raises the question as to the extent to which technology can be guided in its development into desirable directions without stifling innovation.

Building on his conceptual treatment of starting points and approaches, Hetman proceeds to set forth in technical detail a number of methods for conducting assessments of technologies with special reference to their social impacts and their total implications in terms of indirect, delayed, and noneconomic consequences along with their direct, immediate, and economic effects; in other words, in relation to a holistic cost/benefit system.

The need to go beyond immediate outcomes in evaluating alternatives is pointedly developed by Locatis and Gooler (1975) in a review-type article on the inclusion of second-order consequences of technology as applied to education considered as a prototype of technology assessment in general. The idea of pursuing the consequences of technological developments well into the future has been made the subject of extensive speculation and study.

Considering the impact of technological change on values, Baier and Rescher (1969), together with a number of distinguished colleagues, present a highly comprehensive treatment, both conceptual and empirical, of the subject of values and value change in the future. The well-formulated ideas, accompanied as they are by illustrative applications of a variety of research methods, offer the prospective researcher much needed help in this difficult field.

The choice of courses of action in the face of expanding technical knowledge requires clear criterial guidelines. Inherent in this approach, as in all assessment, is the underlying theme of value judgment and the continuing attempts to objectify its application to an extent that is both appropriate and feasible.

Implementation: Change Strategies

The implementation of an innovative program requires planning on a number of fronts. As noted in another section of this document, several basic models have been developed with respect to knowledge dissemination and utilization in organizational change. Specific strategies that may be used by change agents or change agencies are also discussed elsewhere. The present section: (a) illustrates the bearing of various general principles on implementation in several fields; (b) stresses the place of power and persuasion in achieving change; (c) considers resistance to change; (d) reviews modes of reducing resistance; and (e) closes with an account of studies on the role of leadership in accomplishing innovative adoption.

SOME GENERAL PRINCIPLES ILLUSTRATED

Applying Kurt Lewin's model of social change to organizational settings, Benne and Birnbaum (1960) suggest three strategies for achieving change: (a) increase the driving forces; (b) decrease the restraining forces; and (c) combine the two. From the model the authors extrapolate a number of principles for effecting institutional change:

1. To change a subsystem, relevant aspects of its environment must be changed.
2. To change behavior at one hierarchical level, complementary and reinforcing changes at other levels are necessary.
3. The place to begin is at points where strain exists and dissatisfaction with the status quo is a motivating factor.
4. In diagnosing possibility for change the degree of stress and strain where change is sought needs to be assessed.
5. In a bureaucratic structure, change should ordinarily start with the policy-making body.
6. Both the formal and the informal organizations of an institution must be considered in planning change.
7. The effectiveness of planned change is related to degree of participation of all hierarchical levels in fact finding, diagnosis of needed change, and the formulation and testing of program goals.

The need for a broad, systematic, and thorough program of diversified types of efforts, if significant changes are to be implemented, is recognized by the National Institute of Education (1973) in the description and prospectus of its program presented elsewhere in this document.

There are three types or categories of strategies for change, as presented by Chin and Benne (1969), each with its historical and philosophical base. *Empirical-rational strategies* are based on the assumption of the rational man who changes his behavior on the basis of proper information and knowledge in response to environmental stimuli. *Normative-reeducative strategies* are based on the view of man's transactional relationship with the environment. *Power-coercive approaches* view power as a source of all human action and seek to mass economic and political power behind change goals by nonviolent tactics, use of political institutions, and recomposition and manipulation of power elites. Methods for implementing the above strategies are presented and discussed, and relationships among the strategic types are delineated.

Drawing on several sources, Zaltman (1973) presents a "typology of change strategies" that includes, in addition to the three strategies mentioned above by Chin and Benne, the following groupings: (a) normative, coercive, and administrative strategies; (b) power, persuasive, and reeducative strategies; (c) individual change, data-based presentations regarding the system, organizational development, violent and nonviolent direct action strategies; and (d) manipulation, persuasion, and facilitation strategies.

The distinction as to power, persuasive, and reeducative strategies is made the basis for organizing a large section comprising 19 articles on strategies for social change in a book of readings by Zaltman et al. (1972). Political activity, both nonviolent and violent, is given major emphasis in the treatment of *power strategies.* Under the *persuasive strategies,* stress is placed on propaganda, communication, and the allied fields of advertising and mass media. Reeducative efforts are presented largely as applying to specific target groups such as juvenile offenders, occupants of skid row, and prisoners of war.

G. Jones (1965b) notes six interrelated elements in the deliberate planning for social change: (a) agent change; (b) client system; (c) goals; (d) strategies and tactics; (e) structuring of change; and (f) evaluation. His article examines successful cases on planned organizational change in traditional societies, and isolates, defines, and classifies strategies and tactics which performed critical roles in the change processes. His strategies are grouped as follows:

Coercive Strategies
  Strategy of Pressure
  Strategy of Stress Induction

Normative Strategies
  Strategy of Participation
  Strategy of Education/Training

Utilitarian Strategies
  Strategy of Placement
  Strategy of Empiricism

Other Change Techniques
  Tactic of Action Research
  Tactic of Technical Modification
  Tactic of Marginality

The author firmly believes that modern man can to a considerable extent control and direct organizational change rationally, intelligently, and effectively toward the goal of a better life.

The final sections of the book of readings by Zaltman et al. (1972) dealing with the management of social change cover the following topics:

1. Planning for social change:
   (a) Establishing objectives.
   (b) Seeking "shortcuts" to social change.
   (c) Utilizing social research to improve social practice.
   (d) Employing a marketing approach to planned change.
   (e) Coping with ethical problems by social scientists.
2. Implementing change programs:
   (a) Reaching target audiences.
   (b) Meeting resistance.
3. Controlling change programs:
   (a) In terms of evaluation of action programs.
   (b) In terms of reforms as experiments.

The elements of planned organization change, and more specifically those involved in the process of implementation, are noted by Bennis (1969b) as follows: Planned organizational change involves interpersonal competence of managers; legitimation of values concerning human factors and feelings; reduction of inter- and intra-group tension by increased understanding; development of team management; conflict resolution through training in problem solving; developing a view of organization as an organic system marked by mutual trust, interdependence, multigroup membership and shared responsibility.

The process of implementation includes the following necessary elements: client understanding; control and trust; self-motivated change effort through legitimation and reinforcement of the change by top levels of the organization; inclusion of emotional and value elements in the change program; and the change agent-client relationship.

In a treatise that deals with social change and the mental health of children, the Joint Commission on Mental Health of Children (1973c) outlines a broad program, one that reflects an analysis by Ronald Lippitt of barriers to change as existing in our assumptions, in our institutional and professional practices, and in the deficiencies of our knowledge and skills. The proposals for program development contain several special features:

1. A design for youth involvement and participation in program planning and implementation.
2. The education of the young for participation in adult roles.
3. The recruiting and training of volunteers and paraprofessionals.
4. The application of a self-renewal model for the development and maintenance of the several programs.

In sum, along with the more traditional approaches, the report advocates an approach to mental health implementation with special reference to developmental and preventive functions.

After outlining the many areas in which mental health programs need to be expanded and improved, Robinson, DeMarche, and Wagle (1960) note certain propositions regarding the implementation of the proposed lines of change. For example, they suggest that in keeping with the diversity of settings, community programs design and treatment methods vary considerably. Consultation with knowledgeable persons in the several communities and utilization of voluntary agency consultants are considered necessary to good program building. The development of qualified manpower of various types is also essential to an effective program. They add that, while most of the proposed lines of action do not need to await further research, a broad, concurrent research program is desirable.

Concerned with problems of educational innovation, Pincus (1974) asserts that while commercial

or industrial firms are more likely to adopt innovations that promote economic efficiency, schools are more likely to seek innovations that promote bureaucratic interests and social stability. At the same time, he notes that schools are often hard pressed for funds, and hence system maintenance is a realistic concern. The federal aid system is seen to have a number of attributes which discourage innovation in school systems. Among these, for example, are the following:

1. Frequent changes in program priorities.
2. Provision of seed money rather than continuing funds.
3. Small-scale support compared with other programs.
4. The ignoring, at times, of evaluation reports (although he suggests many are not worth heeding).

To the extent that these assertions are true, the course of implementation is likely to be uncertain.

POWER

A careful analysis of the uses of different kinds of power in implementing organizational change has been made by Greiner (1967). He describes: (a) unilateral power, in which the executive decides; (b) shared power, in which decisions are jointly made; and (c) delegated power, in which decisions are turned over to subordinates, either singly or in groups. While executive power by itself is thought often to be ineffective, the commingling of the several kinds of power is considered most effective for promoting change. Too often, the decision is permitted to fall between unilateral and delegated power, without the kind of interchange that shared power entails.

Mann and Neff (1961) indicate different types of power that the change agent needs to understand and be able to use: *legitimate power*—based on obligation or duty; *reward power*—ability to give or withhold reward; *coercive power*—potential for punishment; *expert power*—based on greater knowledge or ability; and, *referent power*—based on attraction and/or identification.

According to Walton (1969), there are two systems of ideas about social change that often present a dilemma to the practitioner. First is the tactic of power strategy, which has as its objective the obtaining of concessions; second is the tactic of attitude change, which aims to reduce intergroup hostility. The two tactics can be further delineated in terms of contrasts such as: emphasis on power to coerce versus trust; threat versus conciliation; and stereotyping versus differentiation. Two solutions to the dilemma are proposed:

1. To use the two strategies in sequence, as in the freeze-thaw tactics in international relations.
2. To have the contradictory strategies implemented by different persons or subgroups.

The dilemma can be minimized further by selecting tactics from each of the strategies that reinforce rather than detract from the alternate strategy.

PERSUASION

An alternative to the power approach is the psychological persuasion of facilitation strategy, in which potential users are perceived as clients (Guba, 1968). Glaser and his associates (1967) used a number of methods of persuasion in inducing rehabilitation agencies to consider the applicability of a new technique developed by Tacoma Goodwill Industries for training retarded persons for work. They then assessed the effectiveness of each method of communicating the procedures and results of the Tacoma R&D project. A popularly written, easily understandable description of the new practice was somewhat effective, but a conference coupled with a visit to the demonstration site followed by discussion not only of the model practice *but also of the promising innovations developed by each agency represented at the conference*, was more effective. Visits to various agencies by a traveling consultant added little to these two strategies for facilitating utilization.

There are several of what might be classified as "cookbook"-type summaries on methods for getting under-utilized knowledge applied more widely, although in fact they involve much more than "persuasion" strategies: Rubin (1968) in educational organizations; Watson and Glaser (1965) in business; Niehoff (1966) in developing countries; and American Institutes of Research (1973) in the area of mental health centers.

Zander (1962), noting that the common denominator of examples of resistance to change rests on a self-protective mechanism, gives a list of some of the obstacles persuaders may encounter and suitable strategies for overcoming them. Among the scores of empirical studies reported, one by Anderson and McGuire (1965) found that persuasion is more likely to succeed if the persuader first shows that he sees the logic of the current way of doing things, and only later presents the seeming advantages of the proposed change. Maier (1963) suggests using what he calls the "risk technique" in which potential adopters of a proposed change are first invited to identify all the risks or possible objections they can think of and, after discussion of

these, asked to consider offsetting or trade-off cost-benefits.

Lewin and some of his followers have provided an explicit theory of persuasion (Lewin, 1962; Lewin & Grabbe, 1962; Jenkins, 1962). Essentially, this entails taking action to reduce the resistance to change and/or the attachment to the present way of doing things. Rather than attempting to make the new seem more attractive at once, the client is induced to look more critically at the old. The forces making for stability and those impelling change are analyzed. Then steps are taken to unfreeze the present situation, move it to a new level, and then stabilize the situation at the improved level. They see this as a process of reeducation, and suggest that cognitive changes, changes in values, and changes in actions occur—pretty much in that order.

As noted elsewhere, Fairweather et al. (1974) found that active persuasion intervention by the change agent coupled with having a group of "champions" within the hospital to spearhead the change effort were the essential ingredients in the successful adoption of an innovative procedure and program in returning mental hospital patients to the community. In a study by Mann (1971), the didactic, or classroom, training approach to human relations proved inferior to an interactive feedback procedure whereby attitudinal survey data were fed back to workers and supervisors. The latter technique was also used effectively by Miles et al. (1971).

An interesting point of view regarding the use of persuasion rather than power in applying revolutionary strategies is expressed by Freire (1972). He states that revolutionaries are prone to use the tactics of conquer, divide and conquer, manipulate, and invade culturally. He proposes, instead, cooperation and cultural synthesis as the only true sources of liberation.

RESISTANCE TO CHANGE

Change is often accepted with little or no objection (Spicer, 1952). However, when resistance does occur, it may seriously block or undermine an innovation. An understanding of the possible sources of resistance may thus be critical to the success of efforts to implement innovation.

In an overall analysis of factors accounting for resistance to change Watson (1973) distinguishes between *resistance in personality* and *resistance in social structure.* Under the former rubric he considers the following factors: homeostasis, habit, primacy, selective perception and retention, dependence, illusion of impotence, superego, self-distrust, insecurity and regression, deprivation, and anxiety. Factors in social systems that contribute to the resistance of change are listed as: conformity to norms, systemic and cultural coherence, the sacrosanct, rejection of "outsiders," hierarachy, affluence and leeway, restricted communication, and the nature of the innovation.

One of the most frequently found generalizations regarding resistance is that *resistance occurs when those affected by a change perceive it as threatening* (Spicer, 1952; Bright, 1964; Havelock, 1969a; M. Becker, 1970b). In this context, resistance is viewed as a device that functions to protect the individual against fears and anxieties aroused by the implications of the proposed change. More specific instances of resistance based on fear are suggested by the literature.

Fear of loss of status or prestige or power is often cited as a major reason for resistance (Spicer, 1952; Marmor et al., 1969; Bright, 1964; La Piere, 1965; Berlin, 1969). Persons who have benefited the most from an existing order are unlikely to welcome a major change (Costello & Zalkind, 1963). In a study of staff response to a mental health innovation, it was concluded that the intensity of the negative reaction of professionals appears related to the extent to which the power and prestige of local service chiefs are threatened, the extent to which existing informal work relations are disrupted, and the extent that coercive pressures are applied, to require marked deviations from traditional procedures (Blum & Downing, 1964). Fear of loss of status and prestige appeared to be a significant factor in a study of a hospital practices innovation which, despite initial acceptance and apparent technical success, was ultimately rejected after several months. One possible explanation offered by the authors is that the innovation disrupted the social organization of the nursing unit and resulted in some loss of authority for the head nurse (Coe & Bernhill, 1967).

Persons resist changes that *threaten job security* (Spicer, 1952; Bright, 1964). *Innovation may threaten devaluation of the knowledge or skills presently required* (Bright, 1964; LaPiere, 1965). This, plus threatened status, may be the source of the frequently found resistance of mental health professionals to the employment of subprofessionals.

To support an innovation may mean to others that they will be seen as deviant (Cartwright, 1962; E. Rogers, 1962a; Borman, 1965) and spotlighted as targets for attack (Cawelti, 1967).

Resistance is aroused when proposed change threatens or challenges currently held beliefs and values (Hovland et al., 1953; Anderson & McGuire, 1965). Some persons cannot seem to hear or understand proposals that appear to run counter to long and firmly held beliefs (Lewin & Grabbe, 1962; Watson, 1973). Berlin (1969) points out that "learning new methods of working and especially using new models like public health concepts, are threatening to our established and already learned theoretical frameworks and practices." Since the practitioner's theoretical framework is essentially his professional value system, he is likely to protect all components with some fervor. Moreover, innovations backed by research findings may be particularly threatening to mental health professionals, since much of the theory in this area has not itself been tested empirically.

Fears of loss of self-esteem or sense of competency and/or fear of exposure of weak points can arouse very strong resistance (Berlin, 1969; Havelock, 1969a; Glaser & Ross 1974). Similarly, one study in a mental health setting reports that resistance emerged because of the researchers' failure to outwardly acknowledge currently successful efforts (Poser, Dunn, & Smith, 1964). This source of resistance may be an important factor in the difficulties often encountered in the conduct and subsequent application of evaluative research.

Another fundamental generalization is that *people resist changes which they don't understand* (Spicer, 1952). LaPiere (1965) points out that there is a pervasive fear of the unfamiliar among humans. "Fear of the unknown," he states, "can even override the certainty of acute physical pain." Relatedly, studies of teacher rejections of innovations in teaching media found that some rejections occurred because of lack of adequate information. Innovations were claimed to be too complex to be understood (Eichholz, 1963; Eichholz & Rogers, 1964). This might suggest that resistance can stem from either a lack of understanding of the effects of a change, or from inadequate understanding of the nature of the change itself.

In some enterprises there is a kind of resistance which is called N.I.H. (Not Invented Here!) One department may be proud of its own achievements and resentful of designs coming from "outside." Fox and Lippitt (1964) found teachers feeling that it would be beneath their professional status to borrow from others.

A fundamental principle of resistance is that *people resist being forced to change* (Spicer, 1952). The importance of this source of resistance can be reviewed through a rather famous illustration of research designed to influence practice reported by Marrow and French (1962). Top management worked with a behavioral scientist in a study of the productivity of older women in a factory. The results convinced both the researcher and the president that these women were excellent employees, but supervisors still retained their old prejudices in spite of this new information and resisted hiring older women. Not until the whole issue was opened to a group discussion of the supervisors, and they themselves were allowed to come to a group decision, did they decide to give the new personnel policy a fair try.

LaPiere (1965) distinguishes between rational resistance, whether overtly or covertly expressed, and *irrational antagonisms.* A rational objection would be, for example, that others who tried an innovation have abandoned it. Irrational factors include apprehension about the unknown, or rigid adherence to certain traditions. A threat to vested interests is rational; suspicion of a secret, worldwide conspiracy may border on the paranoid.

Klonglan and Coward (1970) offer additional insights into resistance through their analysis of adoption as a two-phase process, *symbolic adoption* (acceptance of the idea) and *use adoption.* This suggests that the source of resistance might be pinpointed: symbolic rejection would be related to sociological variables (compatibility, etc.), while economic variables would be involved in resistance to use adoption (trial rejection).

In an organization, desired changes in one part may bring corresponding but unwelcome changes elsewhere in the system. These *side effects* may not have been anticipated and they may stir strong resentment (Costello & Zalkind, 1963; Katz, 1963; Miles, 1965; Wiles, 1965; J. Taylor, 1968). Sieber (1968) warns that resistance may be seen as having personal sources when it is actually imposed by system, position, and role. Moreover, resistance may indicate a real impracticality of the proposed change (Spicer, 1952). Rogers and Shoemaker (1971) cite the hazards of *overadoption*, because of insufficient knowledge, inability to predict consequences, or a mania for the new.

Factors affecting resistance to innovation are presented by Zaltman et al., (1973) as follows:

1. Among the possible determinants of resistance are: (a) the need for stability; (b) the use of foreign jargon; (c) impact on existing social relationships; (d) personal threat; (e) local pride; (f) felt needs; and (g) economic factors.
2. Structural factors affecting resistance include: (a) stratification; (b) division of labor; and (c) hierarchical and status differentials.

3. Individual resistance factors include: (a) perception; (b) motivation; (c) attitude; (d) legitimization; (e) accompaniments of trial; (f) results of evaluation; (g) actual adoption or rejection; and (h) manner of dissonance resolution.

Barriers to the implementation of an innovation in an experimental low-income school whereby teachers were to adopt a "catalytic role model," as contrasted with the more traditional, authoritarian approach, are listed by Gross et al. (1971) as follows:

1. The teachers' lack of clarity about the innovation.
2. The teachers' lack of required capabilities.
3. The unavailability of necessary instructional materials.
4. The incompatibility of organizational arrangements with the innovation.

The authors comment that the literature on change tends to focus on organizational conditions existing prior to the planned effort, but gives relatively little attention to the period during which the implementation effort takes place. A continuing concern with the acceptance level of the participants is suggested.

REDUCING RESISTANCE TO CHANGE

Most persons and organizations are in "quasi-stationary equilibrium," with some forces driving them toward change and others resisting it. To reduce the resistance creates forward movement with less tension than if effort is made only to override it (Lewin, 1962; Miles, 1964c; Cottle, 1969; Watson, 1973).

It is often hard for the advocates of a new idea to empathize with those who don't go along. It is helpful to recognize the *important social role* of the *defenders* who try to conserve the valuable elements of the old in the face of a tumult of change (H. Klein, 1968). Empathizing with them, the progressives can enter a dialogue that may result in amendments which permit broader support of the new idea. Failure to respect differences in values is likely to bring a backlash of increased resistance.

In his article on "how to change things", Reddin (1969) cites seven techniques for overcoming resistance: (a) diagnosis; (b) mutual setting of objectives; (c) group emphasis; (d) maximum information; (e) discussion of implementation; (f) use of ceremony (ritual); and (g) resistance interpretation.

In discussing resistance to change, Watson (1973) outlines the life cycle of resistance to an innovation and the psychological factors of individual and groups that affect resistance.

The life cycle of resistance is seen as entailing the following:

1. Undifferentiated resistance.
2. Differentiated resistance.
3. Mobilized resistance, resulting in a showdown.
4. Sufficient success so that only conspicuous error could re-mobilize the resistance, with supporters of change taking power.
5. One-time advocates of change becoming resisters of emerging change.

Sources of resistance in individuals and social systems are spelled out. Thirteen recommendations about resistance to change grouped under three categories are given: (a) Who brings the change? (b) What kinds of change succeed? (c) How is it best done?

Judson (1966) points out that almost every negative response to change can be converted into an opposite and equal positive response; for example, the person who fears loss of status can be shown that, in truth, the change could eventually enhance his status. Judson admits that resistance to change can, in some settings, be offset by compulsion, but that more compatible long-term strategies might include: to persuade that the rewards of the change counterbalance or outweigh the reasons for resistance; to dispel fear through specific reassurances; to develop a full understanding of the change; to provide opportunity for personal involvement in making decisions related to change; to avoid implications of criticism as change is charted; to install change with flexibility so that those who are affected have the opportunity to modify the innovation to meet their specific work situation.

Lippitt and Fox (1967) found an increase in response by teachers to proposed innovations when comparing the effectiveness of face-to-face group discussion of innovative possibilities with that of an impersonal appeal through the mails.

Hovland et al. (1953) identify the kinds of communication appeals that provide strong incentives for acceptance of change: substantiating argument; positive appeals calling attention to rewards to be gained from acceptance (in contrast to fear appeals); congruence with group norms; explicit statement of conclusions (rather than reliance upon recipient to draw his own conclusions).

In many organizations, the techniques of group dynamics create a climate of mutual trust and openness which dramatically dissipates resistance to change. Procedures for developing this kind of relationship are variously called T-groups, L (for laboratory learning about leadership) groups, sen-

sitivity training, and encounter groups. The usual procedures are well described in E. Rogers (1968), and in Schein and Bennis (1965). Case studies of its uses are offered by Beckhard (1966, 1971). Another treatment of group dynamics will be found in Cartwright (1962).

An increase in the effectiveness of individuals or teams as agents of planned social change in local communities was demonstrated by Schindler-Rainman and Lippitt (1972), indicating the need for concerted effort in overcoming community resistance to change. As a result of the team training of professionals, paraprofessionals, and volunteers from a community working together to effect social changes in specific problem areas, performance was found to improve notably. The training consisted of guidance and feedback from professional trainers, interaction among team members, and consultation between and among teams.

In a study of the effects of various incentives for overcoming resistance to family planning in Asia, Rogers (1973a) compared the use of incentives offered directly to potential adopters of innovations in contradistinction to those diffusers who provided intermediary influence upon adopters. In effect, the intermediaries served as a continuing bridge to persuasive communication.

Carmack (1965) cites the preparation of the community for desegregation of public schools in Dallas, Texas, as a case study of the practical application of communication theory. He gives meticulous attention to: source credibility; cooperation of opinion leaders of all relevant community groups; person-to-person communication among peers; effective utilization of channels for mass communication; and the central theme of the message to be communicated. The Dallas experience illustrates the knowledgeable and planned use of mass media, opinion leadership, and intergroup cooperation in the accomplishment of a general community goal.

It is particularly important that participants feel free to express their doubts and negative feelings. Some promoters of a change find it hard to believe that a frank facing of disagreement and obstacles may win more converts than does eloquent exhortation in favor of their proposal. Yet this has been the experience of many consultants on change (Zander, 1962; Benne, 1962a; Glaser, 1967; Glaser & Taylor, 1969). Conflict of opinion followed by sincere, skillful attempts at conflict resolution may be more productive than is bland agreement, which often is unaccompanied by any sense of concern or commitment.

The use of "temporary systems" (Miles, 1964d; 1965; Moriarty, 1967; Havelock, 1968b, 1969a, 1969b) to free up communication, enhance trust, and build more productive cooperation is widely advocated. Collaboration between research workers and practitioners can be facilitated by a few days of meeting together, away from their offices and duties, with the help of a skilled professional to guide the group growth processes (Schein & Benne, 1965; Havelock, 1969b). Likewise, the wish of management to introduce innovation can be much better accepted by other personnel if the decisions are reached after some team training (Marrow, 1969). Miles sees the special advantages of a temporary system in the fact that it is held only for a short time, at a place separate from the daily office pressure, so people may experiment with new behavior under conditions of low risk and high learning. The norms which develop in such groups favor openness, authenticity, sharing, inquiry, and mutual aid. Periods of good experience in temporary systems can enable work teams to deal better with real problems in a constructive, creative way.

THE PLACE OF LEADERS IN INFLUENCING ADOPTION

In any hierarchical organization subordinates become highly sensitive to the values and preferences of persons in higher positions. In some cases, if the man at the top desires an innovation he can bring it about by fiat (Greiner, 1967). "The rate of adoption of collective innovations is positively related to the degree of power concentration in a system" (E. Rogers, 1962a). In every case, support of top leadership will be a strong factor in bringing about change (Flanagan, 1961; Glock, 1961; Likert & Lippitt, 1963; Mansfield, 1963a, 1963b; Richland, 1965; Sieber, 1968).

Persuasion to change behavior can operate at three different levels. Kelman (1958) has called these: *compliance, identification,* and *internalization.* One complies when one must; this usually means enforcement by sanctions and close supervision. Identification with an admired person may lead to a change which persists only so long as that attraction remains salient. Internalization, the most powerful and stable change pattern, requires that the individual really believe the message. Then he will need no policing or approval from authority figures. Glidewell (1962) has designated the same three patterns for conversion alliteratively as: bargaining, belonging, and belief.

Some steps top leadership can take to facilitate use of research findings are:

1. Clearly advocate, in principle, self-renewal of individuals, departments, and the total organization (Gardner, 1964).
2. Permit experimenting persons and groups to make some mistakes without reprisals (Agnew & Hsu, 1960; Zander, 1962; Bright, 1964; Watson & Glaser, 1965; Cawelti, 1967).
3. Provide for pilot experiments (Berlin, 1969).
4. Arrange rewards, recognition, and promotion for successful experimenters (Bowman, 1959; Benne, 1962b; Eichholz, 1963; Howard, 1967; L. Carter, 1968a; Berlin, 1969). Wolfensberger (1969) suggests that innovative ideas be rewarded, whether they are actually accepted or not.
5. Encourage attendance at conferences and workshops where new ideas are likely to be generated (Menzel, 1966c; Mackie & Christensen, 1967; Cady, 1968; L. Carter, 1968a; Glaser & Taylor, 1969; National Science Foundation, 1969).

Somewhat offsetting the strategy of change from the top down, is the fact that subordinates often can and do subvert changes of which they disapprove, while appearing to conform. "Changes brought about by the authoritative approach are more likely to be discontinued than are those which come from a participative approach," and "an individual's acceptance of an authority innovation decision is positively related to his part in innovative decision making" (E. Rogers, 1962a; Rogers & Shoemaker, 1971).

Leadership in the diffusion of innovation is not limited to hierarchical leadership. Certain influential individuals within colleague reference groups or peer groups function in the role of opinion leaders. Involvement of opinion leaders as advocates of new ideas is an effective strategy of planned change (E. Rogers, 1962a; Burke, 1968; Rogers & Shoemaker, 1971).

Another potential source of prestigious leadership that can influence adoption can be found in the governmental agencies which support research (Havelock, 1969a). They can encourage collaborative projects between researchers, developers, and users. Indeed, Havelock suggests that government agencies should not only encourage research utilization but should insist on it by requiring that dissemination and utilization plans be part of the contract in projects funded by these agencies.

Leaders or managers of an organization can best assure responsiveness to changing needs and capitalize on emerging opportunities by non-defensively inviting, respectfully hearing, and clearly rewarding the expression of constructively creative discontent; by encouraging the spirit of Thomas Edison's slogan for his laboratory: There is a better way—find it!

Follow-Through: Evaluation

If research is to result in improvement of personal and organizational services, it is not enough to identify real problems, to design jointly excellent research plans, to evaluate and interpret findings, and to introduce promising innovations. Innovations require time to prove their worth and to win acceptance. Some early disappointments are almost inevitable. Hence the importance of continuing support and consultation. Jenkins (1962) points out that whenever planned change occurs, care must be taken to insure that the new condition is stabilized; otherwise the resistant forces may push back toward the former condition.

In discussing his A VICTORY model for organizational change, H. Davis (1973) notes that four steps are involved, the last of which is follow-through, including evaluation and recycling designed to maximize the benefits of the change. Similarly, Paisley (1969), in his analysis of the stages of message transmission and acceptance, provides for posttrial evaluation following the tentative trial of the new idea by the message receiver.

In *Project Changeover* (Union for Experimenting Colleges and Universities, 1967) after faculty members had been promised administrative support for carefully worked out ideas and plans for better teaching, a substantial number felt frustrated because the necessary space and supplies were not provided. In particular, it was hard to persuade university officials that teaching a highly innovative course takes at least twice as much time as does more conventional instruction, and teaching loads need to be correspondingly adjusted.

Every significant innovation is likely to run into some difficulties. There are "bugs" in the first model of every invention. Support from top management can be a key factor in giving the new enterprise time and leeway to adjust and to survive. Without sympathetic encouragement from the chief, the innovators usually succumb to the hostility of opponents of the change. They leave the organization or lose heart in further efforts to improve. Research utilization has inevitable elements of risk (R. Lippitt, 1965b), and corresponding need for extra encouragement. It is realistic to keep in mind that not all acceptance of innovation is enduring (and in many cases it may not *deserve* to be enduring). An innovation may be discontinued because it has been replaced by a better idea or because of disenchantment with the results of the

innovation or because of greater comfort with or vested interest in the previously established ways of performing the given function, etc. (Rogers & Shoemaker, 1971).

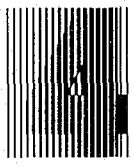
A key element in the follow-through stage is evaluation (R. Lippitt et al., 1958; Benne, 1962a; Miles, 1964c; Watson, 1964; Bobbe & Shaffer, 1968; Rogers & Svenning, 1969). Innovation should be introduced in a way which provides for evaluation as a matter of course, and for the expectation that the first model will not be and need not be the last word. The "adoption" of a recommended innovation should not be a finished act; it should be only the beginning of a continuing process which may lead to something much better than the original design. This recommendation of *continuing* search for and openess to improvements for carrying out any given function or meeting any objective is implicit in the whole literature of technological development and social change. It is explicit, for example, in Likert and Lippitt, 1963; E. Wilson, 1961; Watson, 1967a, 1967b; and in Lippitt and Havelock, 1968. It is part of the essence of John Gardner's concepts (1961, 1964) of pursuing "excellence" and "renewal."

The evaluation of an innovation may be an important key to the long-range success of the effort. D. Campbell (1969) points out that without objective evaluation the effects of an innovation might easily be misinterpreted, and suggests ways in which social reforms can be staged as experiments. Havelock (1970) perceives, as a segment of follow-through, the change agent's development of his client's continuing capacity for self-renewal.

Halpert (1972) states that evaluation should not be limited to the final stage in the process of instituting an innovative program. Rather, evaluative criteria based on clearly specified goals and objectives should be applied in the course of innovation and be accompanied by mechanisms for making modifications when a program begins to go off course. According to Halpert, insufficient attention is given to achieving a consensus on clearly stated goals, which, he believes, should precede research or action.

In one of the few longitudinal studies of organizational change, Seashore and Bowers (1970) reviewed the effects of an innovative program after four years. The maintenance of the obtained results may well reflect the interest in open concern and willingness to evaluate, implicit in the following quote from their report: "An organization habituated at all levels to think about, discuss openly, and to weigh properly the full range of elements in the organizational system might well have unusual capacities for self-maintenance and self-development."

The follow-through of evaluation itself, as expressed in a concern with the *utilization* of evaluation, is made the subject of a penetrating analysis by Davis and Salasin (1975). After a review of references to the two terms in the literature, they cite evidence to show a very small percentage of overlapping between the two concepts. Although there may be problems in an inappropriate fusing of the two functions, the authors propose that evaluators follow through in their evaluative efforts by assuming more of a combined evaluator/change consultant role.



RESEARCH-PRACTICE LINKAGE: DISSEMINATION AND THE CHANGE AGENT

The present section zeroes in on the problem of the linkage of knowledge with innovative practice. Three considerations are discussed: (a) the relation between researchers and practitioners; (b) the retrieval and dissemination of information; and (c) the linking roles of change agents and change agencies.

By way of overall reference to the matter of linkage, three large-scale studies of outstanding research dissemination systems are first cited.

The National Institute of Education (1973), in reporting its program for enhancing knowledge production and utilization in education, provides a chart of linkage relationships among various institutions representing the external resource system and the internal operating educational system. The former is comprised of universities, nonprofit institutions, profit institutions, and the federal government; the latter, of state and local educational units. Linkage and support functions, external and internal, are appropriately related to each unit. Internal problem solving is stressed as a function linked to the several sources of research and development information.

In a questionnaire study reported by Havelock and Lingwood (1973), respondents drawn from four research dissemination and utilization agencies indicated the linkages to and from persons or groups with respect to who was involved, the frequency of contact, the medium employed, the type of information transmitted, and the use to which the information was put. What emerges from the data is the possibility of drawing network maps, together with a strong belief in the importance of bolstering linkage apparatus and procedures.

For each of the four alternative model systems for research utilization discussed in the extensive report by Havelock (1974a), the linkage between the research and the utilization functions is given an important place. Basically, according to the consensus of the proposed models, the research and the user "communities" are viewed as separate problem-solving systems that require two-way communication between them as a prelude to the event called "research utilization (RU)". Alternative operational modes employed in the RU systems vary according to the manner in which initiative is carried out on the part of the researchers on the one hand, and the users on the other.

Practitioner-Researcher Relationships

DIFFERENCES BETWEEN RESEARCHERS AND PRACTITIONERS

Researchers and practitioners, especially in the social sciences, seem to inhabit two very different professional "worlds." An investigator seeking truth has a different set of values, problems, norms, and reference groups from those of a practitioner seeking to help clients. This point has been made by numerous analysts of the lag between research and practice (Cohen, 1959; Guetzkow, 1959; Joint Commission on Mental Illness and Mental Health, 1961; Dexter, 1965; Schoenfeld, 1965; Marquis & Allen, 1966; Barbichon, 1968; Rubin, 1968). The extent of the distance between the worlds of research and practice is reflected in one author's description of these areas as "two solitudes" (Joly, 1967).

In discussing the relation of research to practice, Short (1973) describes the mismatch between the knowledge produced by researchers and that required by practitioners. He suggests that researchers should try to understand the complex ways in which knowledge is used in practice.

Garvey and Griffith (1971) found that "productive" researchers in psychology are highly organized into small clusters that maintain continual informal contact with each other's work. At the planning stage and while carrying out the research, the researcher tends to interact and communicate only with immediate colleagues. This is followed by a series of increasingly formal presentations of the work, including oral reports, preprints, etc., culminating in journal article publication. The emphasis is on researcher-researcher contact.

Many researchers feel it necessary to communicate only with narrow publics of their intellectual discipline (U. S. Department of Health, Education, and Welfare, 1963; Marquis & Allen, 1966; Bassett et al., 1968; Rosenblatt, 1968; Matheson & Sundland, 1969). As a result, the written reports of in-progress or completed research appearing in journals make excessive use of academic jargon peculiar to a particular specialty (Halpin, 1962; Kogan, 1963). The written reports are often of inferior quality (Schoenfeld, 1965), and hence not very readable (Glaser & Marks, 1966). The limited academic orientation of many researchers, accord-

ing to Archibald (1968), signifies their evident belief that they have completed their commitment when they have reported to the funding agency or have published an article in an academic journal. Joly (1967) recognizes the gap between the researcher's language and that of the practitioner, and how it may result in mutual distrust and lack of communication.

Rodman and Kolodny (1965) describe the research investigator as logical; the practitioner as intuitive. Nagi (1965) contrasts the statistical skills of the research scientist with the clinical skills of the practitioner. Research attempts to discover common patterns in a population; the clinician views each case as unique. The scientist can live indefinitely with the tentative and hypothetical; the administrator wants to act with confidence. As pointed out by Likert and Lippitt (1963), the research worker asks his questions in the form of "Why?" while the practitioner wants to know "How?"

Similarly, the manager or operator tends to seek a prescription—what to do (Glock, 1961). Careful tests of credibility are commonly used in research, less applied by practitioners (Flanagan, 1961). It seems that the practitioner, in order to improve his service, is likely to interpret and apply research findings beyond their limits of reliability and validity; then he may be disappointed and disillusioned.

Practitioners tend to rely on precedent, common sense, and intuition much more than they do on research findings (Pellegrin, 1965; Rose & Esser, 1960). The effects of this lack of appreciation for and understanding of the value of research are defined by one author who describes a vicious circle existing in the field of education: "(a) Many educators do not conceive of the scientific method and research as being of primary significance to their work; (b) this state of mind creates an atmosphere in which low priority is given to the conduct or utilization of research; (c) because of low evaluation and neglect, research continues to be a dubious enterprise; and (d) because condition (c) exists, condition (a) is perpetuated." (Pellegrin, 1965.)

Another example of the contrast in viewpoints arises when the behavioral scientist tries to set up "control groups." He soon discovers that agencies and situations vary in so many dimensions that to control all but one factor would mean to fetter and cripple normal operations. Managers understandably resist such imposition (Nagi, 1965). The same kind of problem arises in attempts to replicate a social experiment (Manela, 1969). It is usually impossible to find a second setting which is enough like the original to warrant the expectation that the changes just like those found in the first project should appear also in the attempted replication. Scientists seek rigor; managers must be realistic.

The most regrettable outcome of this difference in viewpoint is that the problems attacked in most research studies appear trivial to most managers of human welfare (Rosenblatt, 1968), while attempts to interpret and to apply significant research conclusions in realistic social settings are viewed by most "pure" scientists as mere vulgar popularizations (Archibald, 1968; National Science Foundation, 1969). The general tendency of each side to stereotype, to belittle and to reject the work of the other leads to avoidance and/or overt hostility (Schmuck, 1968). The problem is intensified when individuals feel personally inadequate to cope with the latest concepts of an ever-advancing frontier of behavioral science, be they communicating with practitioners, or utilizing research findings (Cohen, 1959; Rosenblatt, 1968).

In order to better understand linkage issues between R&D professionals and decision makers in highway safety, Havelock and Markowitz (1973) used a questionnaire to ascertain the comparative perspectives of the two groups. Also studied were the attitudes of researchers (including research opinion leaders, a subgroup who form a bridge between researchers and decision makers) and of the decision makers toward a series of "myths" regarding highway safety. The report cites specific points of agreement and disagreement on the part of the two basic groups. For the most part, no dramatic differences in the beliefs of researchers and decision makers considered as total groups were apparent, but subgroups among researchers and decision makers had distinctive viewpoints. In spite of this diversity it is possible to identify an "old guard" attitude syndrome that blames the driver, and a "new guard" syndrome that puts more stress on a variety of factors, including the vehicle. The old guard are more likely to be based in industry and in state and local government agencies; the new guard are more likely to be located in universities and the federal government.

The authors found all the elements present for an effective system of research and decision making in the highway safety field but, unfortunately, do not consider them to be properly linked with one another.

Drawing on experiences in working with both health centers and medical schools, Beckhard (1974) notes the clusters of perceptions, defenses, traditions, and stereotypes that impede collaboration between health workers and behavioral scientists. The former, for example, see the latter as missionaries rather than as hard scientists, as persons seeking to introduce change for its own sake, whereas the latter assert that health systems do not welcome their intervention and are run by doctors who do not respect nonmedical disciplines.

Using a semantic differential approach, Tiffany, Tiffany, and Cowan (1969) had research workers, administrators, and consultants, all of whom were participants in a two-day workshop, rate *research workers, research work, administrators,* and *administrative work* on a seven-point scale with regard to the following polarities: (a) useful-useless; (b) relevant-irrelevant; (c) action-oriented/thought oriented; (d) active-passive; (e) visible-invisible; (f) authoritative-indecisive; (g) progressive-traditional; (h) simple-complicated; (i) deep-shallow; (j) socially undesirable-socially desirable; (k) unfavorable-favorable; (l) acceptable-unacceptable; (m) unreliable-reliable; and (n) honest-dishonest. The article presents detailed comparisons of the three groups of raters on each characteristic. On the whole, while consultants did not differ significantly from the other two groups, administrators tended to rate themselves more positively than they rated research workers. The data reflect the lack of shared values between researchers and administrators, and point up the need for a strong linking process between the two groups.

Engstrom (1970) finds that there is considerable evidence to indicate that part of the gap between research and practice is directly attributable to the difference in the value systems or orientation of researchers and administrators, and an accompanying lack of communication between them. Halpert (1972) attributes the gap in mental health services to a failure on the part of both researchers and mental health administrators to analyze questions fully before looking to research for the answers.

Normally the flow of communication is presumably from the researcher to the practitioner. It might be useful to try a reverse communication process—informing behavioral scientists on "the existing state of the [practical] art" (Glaser & Wrenn, 1966). Gaps in existing knowledge, or unmet needs for additional knowledge, might be pointed out; subsequent research then might have more to say to practitioners.

COLLABORATION BETWEEN RESEARCHERS AND PRACTITIONERS

The collaboration of research scientists and practitioners in joint research projects appears to provide the greatest potential for maximum utilization of research findings. The strength of this potential stems from the fact that successful collaboration optimally results in research findings which are not only immediately available and understandable to the practitioner, but are relevant to the realities of the practice situation. Havelock (1969a) points out that, in many instances, the practitioner himself is not the ultimate user but serves as linker with the consumer (a physician's patients, for example, or a teacher's pupils).

Of primary importance is the *identification and development of a research problem that reflects the interests and concerns of those affected by the research project* (Fairweather, 1967; Glaser & Taylor, 1969; Havelock 1969a; Garner, 1972; Mackie, 1974; Hodgkin, Balchum, Kass, Glaser, Miller, Haas, Shaw, Kimbel & Petty, 1975). Glock (1961) states, furthermore, that maximal utilization is likely to occur when researcher and practitioner interests are parallel, such as when both share a humanitarian concern for a client group.

Another basic principle is that *practitioners should be involved in all phases of the research.* Once an area of research need is identified, the collaboration should continue through problem formulation, study design, data collection, interpretation of findings, and application of the results (Croker, 1961; Kogan, 1963; Likert & Lippitt, 1963; Van den Ban, 1963; Nagy, 1965; Rodman & Kodolny, 1965; Halpert, 1966; Glaser et al., 1967; Moriarty, 1967; Glaser, 1968; Glaser & Taylor, 1969). Not only can the practitioner make significant contributions to each of the research phases, but also effect participation of the eventual beneficiaries of research in its design, conduct, and evaluation. Those who have a significant part in planning and decision making are not only better informed but are more committed to making use of findings (Spicer, 1952; Lippitt et al., 1958; Agnew & Hsu, 1960; Rosenfeld & Orlinsky, 1961; Benne, 1962a; E. Rogers, 1962a; Zander, 1962; Costello & Zalkind, 1963; Dykens et al., 1964; Gardner, 1964; Watson & Glaser, 1965; Wiles, 1965; Niehoff, 1966; Cawelti, 1967; Chesler & Fox, 1967; Glaser et al., 1967; Greiner, 1967; Howard, 1967; Likert, 1967a, 1967b; Watson, 1967a; Aiden & Hage, 1968; Glaser & Taylor, 1969).

An important consideration is the *need for the research team to contain a representative of the*

agency's top management. Fairweather (1967) and Glock (1961) emphasize that the person representing administration must have policymaking power. Flanagan (1961) compares two studies, both of which included the users in the planning, but one of which was better utilized than the other, and attributes the superior utilization to the origin of that study with the prospective user and the greater involvement of the management.

Frequent honest and open communication between researchers and practitioners reduces the likelihood of the emergence of stumbling blocks in the study and enhances the chances that research findings will be put to use (Glock, 1961; Poser et al., 1964; Fairweather, 1967; Mackie, 1974).

Another important step in preventing the development of later problems is early *clarification of practitioner and administrator expectations of the research* (Chesler & Flanders, 1967; Fairweather, 1967; Wolfensberger, 1969). Chesler and Flanders (1967) suggest that it is important for the researchers to make clear to the practitioners at the beginning that the outcome will not be clear dicta on how they should run the organization.

Glaser (1973) addresses the lag between the development of seemingly significant research findings and their cross-validation, dissemination, and ultimate utilization. Intensive and supportive joint action is advocated between researcher and funding agency to facilitate effective, end-product utilization, and a number of specific strategies are advanced. Case material from an ongoing demonstration project is presented to illustrate how research utilization can be strengthened through a collaborative partnership among funding agency, researchers, linking agents, administrators and potential users.

Research is also more likely to proceed smoothly when, before starting the project, there is a very *explicit understanding between researchers and agency administrators regarding reciprocal responsibilities* (Fairweather, 1967; Glaser & Taylor, 1969).

Collaboration between scientist and practitioner need not necessarily take the form of a joint research project. For example, in studying the optimal conditions for implementation of existing educational research into classroom practice, Eash (1968) favors a "coaction" model which engages the researcher and practitioner in a mutual problem-solving task. Interestingly, both case studies used to support this model involved the participation of not only the practitioners (teachers), but the consumers (pupils) as well. The additional involvement of the pupils seemed to be an important factor in bringing about change.

The organization of more research around issues of practical decision is a two-way process: The practitioners should try to present their quandries in researchable form; the investigators should more often choose problems that have clear implications for practice (Lazarsfeld, Sewell, & Wilensky, 1967; Argyris, 1969). If research scientists spent more time in the field, they would better understand the situation, but they are usually reluctant to leave their laboratories. One suggestion is that sponsors who fund projects should require some fieldwork by the investigators (Mackie & Christensen, 1967). Field research usually has implications which can more readily be utilized in practice (Guetzkow, 1959; Guba, 1968a).

A special need exists to increase practitioners' appreciation of good theory. Theory is too often seen as the antithesis of practice (Pellegrin, 1965; Jung & Lippitt, 1966). Kurt Lewin's observation that nothing is so practical as a good theory warrants reiteration. Experience alone does not yield concepts or wisdom (Lewin & Grabbe, 1962). Too often, a piece is chosen out of a whole research enterprise and treated as an innovative "gimmick" apart from the theory which makes it meaningful (Dexter, 1965). Goldin et al. (1969) recommend that training be designed for practitioners which would focus on the understanding and application of research results. On the other side of the coin, they also suggest that the training of researchers should include content on the principles of research utilization with emphasis on the psychosocial aspects of innovation and change. Wolfensberger (1969) recommends that before supporting intra-agency research, the administrator engage in self-scrutiny concerning his own attitudes toward research, what are sanctified areas in his own agency in which he cannot tolerate investigation, how well his agency can survive controversy, and how prepared he is to absorb a divergent, non-conformist creative researcher.

For each of a series of barriers to collaboration between social scientists and community social work practitioners, including such considerations as communication difficulties, interprofessional conflicts, and methodological assumptions, Rothman (1974) proposes "action guidelines" designed to achieve increased collaborative results.

Information Retrieval and Dissemination

The transmission of knowledge from producer to user may be viewed either from the vantage point

of the user in search of needed knowledge or from that of the producer seeking to make knowledge available to potential users. The process as a whole entails the interaction of the two thrusts.

An earlier section of this document treats of the search for pertinent information on the part of the user. The present section principally considers the dissemination of knowledge via the several transmission media.

Nonetheless, the user is not out of the picture in the consideration of dissemination media. Thus, the matter of targeting information toward specific audiences to serve distinctive needs has received the attention of investigators, for example, Magisos (1971) and Crowe and Madancy (1974). In a number of studies, questionnaires have been submitted to various categories of potential users of research or knowledge to ascertain their needs.

Sieber, Louis, and Metzger (1974) report on the procedures and problems of retrieving and transmitting information from educational sources (e.g., ERIC) by means of field agents assigned to two rural-area and one urban-area school systems as part of a pilot state dissemination program. The authors note three aspects of the success of the agency program: (a) the program developed a model for future extension and retrieval programs in education; (b) field agent generalists were shown to be superior to subject-matter specialists; and (c) the majority of clients in all areas (76-90 percent) not only expressed the intention of using the service again, but also recommended it to others.

To be effective, the disseminator needs to be sensitive to the stages through which a message goes as the receiver reacts to it. In this regard, Paisley (1969) distinguishes the following ten stages through which a message progresses:

1. Awareness that a message is being sent.
2. Attention: the receiver tunes in.
3. Exposure: transference via the receiver's sense organs.
4. Comprehension: cognition as to what is being communicated.
5. Retention: the message is kept—or lost—in competition with other messages.
6. Motivation: potential for acceptance.
7. Pretrial evaluation: judgment as to whether to put it to use.
8. Trial: tentative tryout of idea.
9. Posttrial evaluation: examination of the results of the tryout.
10. Complete adoption: use of the idea after decision to adopt it.

It is evident that the mere sending of a message does not automatically assure acceptance and application.

The issue of active promotion versus passive dissemination is referred to by Wright (1966), who reports on a two-phase program of the Office of Industrial Application (OIA) at the University of Maryland which seeks to study the transfer of technical information to industry from the National Aeronautics and Space Administration (NASA). OIA examined the factors that impede and those that facilitate such transfers. Findings indicate that a critical point in the transfer and utilization mechanism is frequently the personal interaction between the intended user and the innovator.

Major reasons for rejection and inaction, according to Wright, were technical and associated with indeterminate applicability and uncertain market potential. Almost eight times as much interest was generated by the possibility of improving an existing product or process as by the chance of acquiring a completely new addition to the inquirer's processes and products.

PRINTED MATERIALS

While not the only source of knowledge, printed materials represent a voluminous repository. Responding to the need to bring selected materials to the attention of users, disseminators have recognized the importance of periodic readable reviews of relevant literature (Kadushin, 1964; Halpert, 1966; and others). H. Klein (1968) reports on a Missouri system which condenses new findings in mental health, translates them into lay language, and makes them available to mental hospital workers. Another report (Matheson & Sunderland, 1969) describes how a central information agency sent notices followed by photocopies of published reports to individuals according to their stated field of interest. Individuals using the dissemination service reported a dual benefit: to themselves in terms of time conservation, and to colleagues to whom they passed on pertinent information. NIMH's recent initiation of the publications *Mental Health Digest, Innovations,* and *Evaluation* is but one example of an effort to provide mental health workers with needed information. NIMH also publishes *Information Sources and How To Use Them* (prepared for NIMH by the Human Interaction Research Institute) as an aid to locating new knowledge in the literature.

Hodgkin et al. (1975) have developed a model for preparing state-of-the-art papers that involve a large (8-9 person) writing team of knowledgeable and eminent researchers-practitioners in a specific field, who in turn iteratively invite successive groups of knowledgeable others to critique drafts of

the paper, until the version finally considered satisfactory for publication is submitted to the entire profession for *their* invited critique, leading to another revision into the final booklet for wide distribution.

Information sources such as these do not force decisions on the user; they merely provide him with knowledge that may aid his decision making.

There also have been efforts on the part of academic groups to publish somewhat popularized renditions of research findings. *Scientific American* is one example. An early instance in the social science field is the *Journal of Social Issues,* published by the Society for the Psychological Study of Social Issues, which was founded in 1936 to serve a middleman function between research psychologists and public officials.

Other publications appeared later in sociology and anthropology. In the mid-sixties several journals were launched to convey to practitioners aspects of behavioral science research which might prove useful to them; notably, *Society* (formerly *Trans-action*); *Journal of Applied Behavioral Science; Journal of Human Resources; Social Policy in the Public Interest; Policy Sciences; Public Interest; Human Behavior;* and *Psychology Today.* H. Klein (1968) sees a need for a pocket-size magazine, as readable as the *Readers Digest,* to tell social workers what the scientists have recently been discovering.

IMPROVED REPORTS

A study of the readership of two research monographs (relevant to rehabilitation) led to the conclusion that most readers who made any use of the findings did so in some speech rather than in any modification of agency practice (Goldin, Margolin, & Stotsky, 1969).

Research reports are seen as more useful if they are brief and readable (Glaser et al., 1967; L. Carter, 1968a). The vocabulary of the specialist needs to be translated into lay language (Dahling, 1962; H. Klein, 1968). The same finding has more impact if it reaches the practitioner several times in slightly differing forms (U.S. Department of Health, Education and Welfare, 1963; Halpert, 1966; Garvey & Griffith, 1967a, 1971).

A report is more effective if it focuses directly and explicitly on a decision which the professional or manager must make (Glaser, 1968; Rosenblatt, 1968). It is important to get the right bit of information to the right person at the right time (Paisley, 1968).

The New England Rehabilitation Institute recommends applying relatively active modes of dissemination to carefully selected targets, such as following up the persons to whom a monograph had been mailed with a questionnaire requesting their reactions to the report and its findings (Goldin et al., 1969). This contrasts with the more common practice of sending out a research finding, via an article or monograph to the world in general (Archibald, 1968). Retrieval systems can be designed to bring each practitioner the information best adapted to his needs (Kadushin, 1964; Thomas, 1964; R. Lippitt, 1965b; Schoenfeld, 1965; Mackie & Christensen, 1967; Cady, 1968; H. Klein, 1968; Matheson & Sundland, 1969).

One suggestion for improving reports is that they should not begin with the usual review of the literature, but should capture the interest of practitioners in their first few pages, stating problems in forms the user will recognize as familiar, and perhaps summarizing some main findings (Goldin et al., 1969). Some consultants to a college administration who reviewed how many of their recommendations had been followed a year later found that (a) major points should have been put at the beginning rather than at the end of their report; (b) too many minor recommendations had been made, which lessened the impact of their main findings; (c) there should have been a more careful appraisal of the costs (in time as well as money) of the innovations proposed; and (d) the bulky appendix was a liability (E. Wilson, 1961).

The publication of research findings does not necessarily result in the widespread absorption of these findings by practitioners. It is estimated that half the articles in "core" scientific journals are each read by no more than 200 persons, although distribution of preprints and reprints augments this total exposure (Garvey & Griffith, 1964a). Monographs, like books, usually attract the more academic reader and have a limited distribution. Thus, the potential for dissemination of new knowledge through the professional literature appears limited because of the relatively small size of the audience in proportion to the actual number of practitioners in the given field.

An article by Greenberg (1967) reveals limited use of NASA materials by commercial firms in certain areas, as reported by the Denver Research Institute's report "The Channels of Technology Acquisition in Commercial Firms and the NASA Dissemination Program". Surveys were conducted of 62 firms in four industries—electric batteries, printing and reproduction, industrial controls, and medical electronics—and 11 "vocational-technical

schools". Few, if any, of these organizations were vigorously seeking to utilize directly the vast outpouring of science and technology that the federal government is underwriting. Instead, the technologist with a problem is inclined to fall back on the standard manuals and textbooks with which he is already familiar. Government publications are not perceived as major channels for acquiring technological information. The preferred channels were found to be professional journals and face-to-face contacts, especially in conventions and symposia. Highly specific subject matter conferences were valued most.

Dissemination to practitioners is further hindered by the fact that research reports are usually read and used by other researchers; seldom by practitioners (Havelock, 1969b). Roberts and Larsen (1971) report that few mental health practitioners make any large-scale and systematic effort to uncover research results which could serve as a basis for change; instead they rely heavily on contact with colleagues to stimulate innovation. Further, most innovations which are adopted emerge from the work experience of practitioners rather than from research results. Practitioners tend to be "doers" and not "readers"; hence, they tend to rely more on oral communication than on publications (Halpert, 1966; Paisley, 1968). This difference in information-seeking behavior between researchers and practitioners leads us into another major dimension of the research utilization problem.

One of the problems with most reports of research is that they strike the practitioner as unaware and unappreciative of what already has been achieved. The reader will be in a more receptive frame of mind if the report begins by recognizing the successful work that has already been done (Likert & Lippitt, 1963).

Techniques of communication designed to influence the behavior of others are summarized in a number of studies of attitude, advertising, and propaganda (Hovland et al., 1953; Katz & Lazarsfeld, 1955; Schramm, 1963; Watson, 1966). Among the techniques empirically found to be effective are:

1. Identify the communicator with his audience.
2. Present the communicator as trustworthy.
3. Use positive reinforcement rather than threat.
4. Suggest that people of prominence and influence agree.
5. If objections are likely to arise later, it is more effective to take account of them at once.
6. Combine logical and emotional appeals.
7. Use pictures as well as words.
8. Repeat, reiterate, say it again.
9. Pretest the coherence and credibility of the communication in draft form before it is put in final form.

One should, however, have realistically limited expectations of the effectivenss of even good reports in gaining acceptance for an innovation; at best, they stimulate interest; rarely do they create active advocacy, particularly if the innovation presents discernible difficulties (Glaser & Ross, 1971).

Time-lag is another deterring factor with regard to published reports. A logjam exists in the formal communications system; i.e., the flow of information through the professional journals. The process between the generation of a research development and its appearance in professional journals and abstracts can consume months or even years (B. Kaplan, 1958). In the field of psychology, for example, Garvey and Griffith (1967a) found roughly a nine-month delay between submission of a journal article and its publication. Moreover, considerable time may elapse between the completion of a study and development of a manuscript for journal publication. Once submitted, the scarcity of journal space often results in rejection of the article (B. Kaplan, 1958).

The common delay in research publication may not always be bad. Delayed formal publication has the merit of being monitored or filtered information, which, when selectively cited in such reviews as the *Annual Review of Psychology* perhaps two or three years after publication, achieves acceptance as part of the pool of recognized knowledge. Garvey and Griffith (1971) note the different functions of formal and informal information transfer in psychology, viewed in terms of the published report and the working paper or technical report respectively. The authors consider the working paper important because it often gives the most detailed account of procedures, instruments, etc., and, because it is informal, it permits the researcher to speculate and to theorize more than does the published article.

PEOPLE TO PEOPLE

Most practitioners learn mainly from face-to-face contact with other people (D. Clark, 1962; E. Rogers, 1962a; Coleman et al., 1966; Niehoff, 1966; Havelock & Mann, 1968; Rubin, 1968; Roberts & Larsen, 1971). They learn most readily from "influentials" in their profession (Watson, 1966; Lazarsfeld et al., 1968; M. Becker, 1970b); from persons with contagious enthusiasm (Bowman, 1959); and from those with whom they feel easy rapport.

Tracing the diffusion of knowledge of a new hybrid seedcorn and of a new antibiotic, E. Katz

(1961) found that information moved through previously established channels of personal communication. Salesmen played an important role, but, "Commercial sources inform; informal (neighbor, professional colleague) sources legitimate." (Also Ryan & Gross, 1943).

Crane (1970) notes that the use of formal or informal channels of information by scientists depends on whether they are searching for knowledge in their specialized area or outside of it. The scientific literature itself is seen as consisting of tightly knit cores which the scientist explores through directive searching for specialized and specific information. Links to other cores result from random searching. How information moves from one group to another, the phenomenon of "scatter of knowledge", which the author regards as necessary for cross-fertilization, is revealed in studies of "invisible colleges", an "elite of mutually interactive, productive scientists in an area". Crane recommends that isolated scientists be brought into closer contact with scientists who are the foci of communication networks.

Rosenbloom and Wolek (1970) distinguish between formal information sources (principally the published literature) and informal sources. They note that professional orientation is usually associated with the use of formal sources, whereas mission orientation is related to the employment of informal ones. The authors suggest that managers should exert effort toward the linking of professionally oriented and mission-oriented activity.

After reviewing relevant literature on factors related to the successful transfer of R&D findings, Glaser (1973) concludes that, at least in some fields, the greatest single means for increasing information may be personal interaction, and that the strategic contact is the "gatekeeper", or well informed colleague. Roberts and Larsen (1971) report a similar finding. Obviously, the process of consultation places major emphasis on person-to-person communication, as is noted in G. Caplan's (1970) treatise on mental health consultation, which discusses this mode of knowledge and judgment transmission in great detail.

Parker and Paisley (1966) report that research workers depend heavily on informal information networks: interpersonal systems, "accidental" acquisition of useful information, "inefficient" and "irrational" information seeking, etc. Accidental discovery of information in stimulating environments, with *many* dissimilar colleagues, unrestricted long-distance telephoning and travel, is especially useful to applied scientists.

Writing about the improvement of communications among scientists, Swanson (1966) urges that informal information practices be aided and amplified, first by identifying the information-exchanging groups, and second, by improving and expanding the selective communication systems within these groups, with a high level of feedback to check on the value of the information dissemination. Swanson states that as much as 85 percent of useful scientific information is exchanged informally before the usual bibliographical sources are consulted to ascertain whether or not published information is available. A future information system should seek out its customers. Its activity should be directed and purposeful, and should have continuous feedback of its own actions.

DEMONSTRATIONS AND VISITS

Many innovations are most convincing when demonstrated (Niehoff, 1966). One suggestion is that the added cost of such a demonstration project be built into the funding of a research proposal (U.S. Department of Health, Education, and Welfare, 1963; Glaser & Wrenn, 1966). It has been found, however, that most observers who visit and admire radical innovations of experimental schools and colleges do not adopt them (Watson, 1964). They see their own situation as basically different. Visits to situations very like those in which the visitor works back home, but where something new is being done, have greater transfer value (Costello & Zalkind, 1963; Brickell, 1964; Miles, 1964d; R. Lippitt, 1965b; Wiles, 1965; Cawelti, 1967; L. Carter, 1968b; Mackie & Christensen, 1967). Glaser and Ross (1971) found that a site visit sometimes engenders enough advocacy so that the visitor may aggressively sponsor the innovation when he gets back to his home agency. Such sponsorship probably would be more productive if two or more persons from the same agency visited the demonstration site and thus could reinforce each other upon return to their own setting. Exchange of professional workers would facilitate this kind of diffusion (Cady, 1968), as would more released time and travel funds.

Richland (1965) reports a traveling seminar, arranged by the System Development Corporation for 120 educators. After visiting schools where various innovations were in operation, the tour members had a day together to review, discuss, and generalize their observations. The project was evaluated by visits one year later to the schools conducted by these educators. In comparison with plausible control schools, the tour participants had introduced many more innovations.

Glaser and Wrenn (1966), following the model so successful in the work of agricultural county agents, suggest that where possible, demonstrations be set up within some influential institutions which might profit by adoption of the innovation. Another proposal is that pilot laboratories be established and assigned responsibility to try out development based on recent research, and to publish practical operating guidelines for use by other institutions (Engstrom, 1969).

Rein and Miller (1966) point out that in the area of social action, demonstration projects often serve to postpone change rather than to facilitate it. They do, however, suggest that success of demonstration efforts can be enhanced by better planning with regard to the kind of influence a project is intended to have, the target group to be influenced, and how influence will be exerted. Similarly, R. Lippitt and Butman (1969), in a study of mental health demonstration projects, reported that all projects need to have more awareness of the needs of potential adopters and the means to assess and evaluate ways of communicating with them, and that projects need help with planning and carrying out spread activities.

In a major study supported by the National Institute of Mental Health, the American Institutes for Research (AIR) (Larsen, Arutunian, and Finley, 1974) provided expense-paid visits to be made by community mental health center staff to other centers to determine the effect upon innovation of (a) site visitation alone as compared with (b) the transmission of pertinent written material and (c) the concurrent use of consultant assistance along with site visits. A careful experimental design was employed as well as thoroughly prepared questionnaires and interview schedules. The written material was specifically designed to encourage innovative programs in mental health services.

The researchers reported that staff reaction to all three diffusion techniques was extremely positive, ratings of "useful to some degree" ranging from 86 percent for the consultant's visit to 94 percent for the site visit. As to preference regarding type of diffusion technique, 79 percent indicated preference for interpersonal techniques as against 19 percent for written techniques, with 2 percent citing other techniques. The improvement of methods of communicating information about new practices to capture user interest was undertaken in a collaborative effort of NIMH and AIR to develop *Innovations* as a publication dedicated to the description of innovative programs. It was evident from the study that, while centers which encourage staff visits to other centers are more likely to consider innovations than those which do not support such contact, appropriate written material *and* outside consultants add to the likelihood of carrying forward the innovative process.

CONFERENCES AND SEMINARS

Personal contact between potential users and innovators may be a crucial condition for the optimal dissemination of new ideas (Glaser et al. 1967).

Conferences in which research reports are presented and discussed with practitioners are more influential than publications or other one-way reports (Glaser & Wrenn, 1966; Halpert, 1966; Chesler & Fox, 1967; L. Carter, 1968a; Engstrom, 1969). A good illustration of the use of a conference is the report by Glaser (1968) on promoting the use of systematized care programs for chronic obstructive pulmonary disease. In another study, Glaser et al. (1967) report the effectiveness of a combined conference/site visit approach.

Cooper and Archambault (1968) report the success of a conference conducted in two parts separated by a 4-month period during which reading lists and materials were distributed. They also reported that providing the participants with an opportunity to determine the program for the second part of the conference increased their involvement with the issues being considered.

Spooner and Thrush (1970) found that an interagency conference regarding a particularly successful innovation, during which implementation plans were worked out, with personal follow-up, aided appreciably in the dissemination of the particular findings and was instrumental in initiating institutional change.

Garvey and Griffith (1967a) recommended that the effectiveness of conferences would be enhanced by advance distribution of papers to be presented to interested participants.

Conferences have a two-way impact (Nagi, 1965). Practitioners face up to the implications of research findings but researchers also profit from the feedback from those who would like more practical assistance.

Havelock and Markowitz (1973) found that well-organized topic-centered conferences on highway safety matters were a key element in binding together this applied R&D community. Such meetings were heavily attended both by R&D opinion leaders and by key national decision makers. Thus, they were a major factor in linking research to practice.

MASS MEDIA

The media of mass communication have not often been utilized to convey research findings. These media reach too broad a public, and there is not enough opportunity for feedback, with give-and-take (Niehoff, 1966). Paisley (1968) observes that ideas are more likely to be accepted if they come via respected channels, but that actual application of innovative ideas depends more on ease of use than on the medium.

Mass media are helpful in making many aware of a problem or new approach; interpersonal communication can build more credibility (E. Rogers, 1962a; Menzel, 1966c; Rogers & Svenning 1969).

An informative review of "powerful research traditions" relative to mass media is provided in an article on communication and social change by Westley (1973). Among the "traditions" discussed is research on the diffusion of innovations. Of particular interest is an account of research on the relative effectiveness of mass media versus interpersonal communication as manifested in diverse social settings. Although mass media and interpersonal communication are not competitors in persuasion but rather supplementary to one another, the role of interpersonal communication is often the critical force in many social settings.

MULTIPLE METHODS

It is apparent that dissemination efforts are frequently not limited to a single medium. The present section cites but a few of the many examples of multiple methods.

The channels of communication are not mutually exclusive and several together are likely to have more impact than any one alone (Menzel, 1966c; Havelock, 1970). Designs for communicating significant research findings may include a combination of T-groups to improve mutual trust, factual presentations, discussion, brainstorming, role playing, and planning for action.

The concept of multi-media packaging of social science knowledge for dissemination purposes has been developed by Manpower Science Services, Inc. (1974). In devising a manual on role modeling and role playing, for example, the agency assembled a set of audiotapes, workbooks on simulation, and a multi-media collection of workshop materials on group leadership techniques. The preparation of the package is based on a model comprising information retrieval, communication, diffusion, and adoption principles.

A "total dissemination push" is illustrated in the efforts of the U.S. Environmental Protection Agency to achieve technology transfer in the matter of municipal waterwaste treatment facilities, as described by Crowe and Madancy (1974). The total program, whose success has been demonstrated, included seminars; publications in the form of design manuals, technical capsule reports, seminar publications, handbooks, process brochures, project brochures, newsletters; audiovisual media, including technical videotapes and nontechnical films; and presentations at professional conferences.

As part of an overall plan for achieving research utilization, Lippitt, in a report by Havelock (1974a), suggests the following implementation mechanisms:

1. Conference of technical resource people.
2. A technical resources panel on a regional basis.
3. An advisory committee.
4. Telephone contact.
5. A regional interagency exchange-of-practice-and-planning meeting.
6. Annual visiting committees.
7. Annual regional conference.
8. National products report.

It is evident that a diversified approach emphasizing interpersonal contact is favored.

In surveying information needs and uses in science and technology Herner and Herner (1967) referred to studies which themselves utilized a variety of information-seeking techniques. These included: reference to diaries and other records, observation, interviews, questionnaires, bibliographic reference, and combination techniques. Similarly, in surveying information needs in education, Paisley (1972), as previously noted, employed a variety of methods: state questionnaire surveys, a follow-up investigation of educators who had requested information from central and local information centers, a collation of views of "information specialists", a "hotline" facility whereby educators across the country call a long-distance toll-free number for information, and a monitoring of topics in educational serial publications.

Other illustrations of multiple strategies, together with their effects, will be found in Glaser et al. (1967) and Fairweather et al. (1974), as noted in Chapter II.

Change Agent Linkage

Of all the suggestions for obtaining research utilization, the establishment of a linkage mechanism in the form of a change agent or agency is the most strongly advocated by many writers. Linkage is basically a series of two-way interactions that connect user systems with resource systems (Have-

lock, 1969a). The articulating force can either overlap the two sides, or bridge the gap between the researcher and the practitioner (Bhola, 1965a). Suggestions concerning the affiliation or position of the person(s) providing the linkage function range from having an individual within the organization serve this purpose, to the development (as in agriculture) of individuals or groups whose mission is that of translating research and helping practitioners to adapt it to their situations, operating from outside the organization. In either case a "middleman" objective is served.

CHANGE AGENT ROLES AND FUNCTIONS

Concept of the change agent. The titles which are used for "middleman" vary and suggest different concepts. Among the earliest was *social engineer* (Watson, 1945; Guetzkow, 1959). R. Lippitt (1965b) suggested *linking agent.* Schwartz (1966) called for a *popularizer* and suggested the name *knowledge linker.* A frequently used name for the middleman role is that of *change agent* (E. Rogers, 1962a). Mackie and Christensen (1967) and also Mackie (1974) used *research translator* and also *learning engineer.* Archibald (1968) favors *applied behavioral scientist* while Riley, Hooker & Masar (1968) and Engstrom (1969) prefer *research utilization specialist* (RUS). Glaser (1973) suggested *knowledge utilization specialist* (KUS) on the ground that many superior practices or procedures for meeting given problems arise from the creative efforts of practitioners or responders to the problem, not necessarily from research. Such demonstrations, if replicable in diverse settings, constitute credible knowledge rather than research findings per se.

Croker (1961), considering utilization of research by military personnel, suggests that officers be trained to be *quasi-social engineers.* Glaser et al. (1967) speak of a *missionary* to assist potential users in relating to some promising, research-validated demonstration project findings. Glaser and Wrenn (1966) refer to a *human link* between the researcher on manpower issues and the policy-makers. They envision also a *change aid team* which might go to any city or institution to help in the process of implementing research results by system changes. The use of a *consultant* in this middleman role is proposed by Lippitt and Havelock (1968). Havelock (1969b) suggests the value of further development of human resources banks which might enable agencies or change agents to locate experts who could select and interpret research, and could assist in the processes of change.

Common to most of the job-portraits of the middleman is an analogy with the outstanding achievements of the county agent in linking agricultural science to farm practices (D. Clark, 1962). Earlier attempts to improve farming by well-edited bulletins and excellent State college demonstration farms did not bring much change in the practices of the average farmer. The genius of the county agent was that he lived close to his clients and ran the kind of homey local demonstration projects which utilized well-known and well-trusted neighbor farmers.

Havelock (1969a) asserts that the notion of the change agent is moving away from that of the agent as the conveyor of new facts, innovations, and research, as in the country agricultural agent model, toward a concept of the agent as *consultant, facilitator,* and *catalyst.* This would imply that the middleman would be serving much broader objectives than simply the spread of information and its linkage to practice.

The central focus of the volume by Lazarsfeld et al. (1967) is the problem of collaboration between clients and sociologists. The two central issues that the authors analyze are: (a) difficulties of translating practical issues into research problems; and (b) unavoidable intellectual gaps between research findings and advice for action. The authors envision a new profession developing that may be considered a third force, in the form of a middleman who mediates between the sociologist and the client. This person would be able to understand the social scientist and be well acquainted with the practical problems of the sponsor. Most of all, he would have the talent and the training "to take the knowledge which is delivered to him and to draw more conclusions from it than could either of the two partners upon whom we have concentrated so far."

Practitioners (who may be citizen groups) are conceived in the role of the change agent by Rothman (1974), who attempts to depict the social change roles of social work professionals, of paraprofessionals, and of lay groups.

The functions of the middleman are numerous and tend to vary according to the nature of the role which is assumed. Havelock (1969a), in a typology of knowledge-linking roles, suggests the following possible functions: *conveyor* (transfers knowledge from producers to users); *consultant* (assists users in identification of problems and resources, provides linkage to appropriate resources, assists in adaptation to use, serves as facilitator, objective observer, process analyzer); *trainer* (instills in the user an understanding of an entire area of know-

ledge or practice); *leader* (effects linkage through power or influence in one's own group); *innovator* (initiates diffusion in the user system); *defender* (sensitizes the user to the pitfalls of innovation, mobilizes public opinion, public sensitivity and public demand for adequate applications of scientific knowledge). Havelock sees marginality and overload as the endemic problems of the linking role.

The linker operates between the resource system and the client system and serves both a knowledge/education function and a motivation function (Bowman, 1959; Benne, 1962a; Havelock, 1967a; Sieber et al., 1974). The role of the middleman may take several forms: technical, professional, or applied scientific. Whether an applied-oriented scientist or a theory-oriented practitioner, he must understand the ongoing change process in the organization, and must present himself in such a way as to be credible (Halpin, 1962; Dykens et al., 1964; Gallagher, 1965; Lundberg, 1966).

In comparing five change models (identified in Chapter V), Sashkin, Morris, and Horst (1973) place particular emphasis on the change agent's linking function, i.e., his mode of handling information and data. For example, in the *research, development, and diffusion model* the key question is: how can the disseminator identify the user population and select a means of communication that will result in acceptance of his information; whereas in the *action research model* the change agent tends to fuse with the researcher in an ongoing interaction between knowledge production and user needs. What this analysis signifies is that a discussion of change agent functions and roles should be qualified by the prevailing change model.

Functioning of the change agent. According to Blake, Mouton, and Sloma (1969), labor-management conflicts and cleavages may be converted into a problem-solving approach on both sides by a change agent team involving management and labor in face-to-face confrontation. An educational laboratory was held based on behavioral science concepts. Eight phases of the conflict-resolving process were included: orientation of participants to the laboratory; intergroup development of self-image and counter-image; exchange of images by management and union; clarification of image; intragroup diagnosis to achieve self-insight and understanding; consolidation of key issues; and planning for the next steps. The authors conclude that correcting a situation of long-term, chronic hostility requires continuous and diligent follow-up efforts. They also found that the impact of the sessions was greater in treating new issues than in resolving old ones, and that increasing interdependence among groups also can breed hostility and disruptive conflict.

R. Lippitt (1962) identifies seven phases of the change agent's activities: (a) the development of a need for change; (b) establishment of a consulting relationship; (c) clarification of the client problem; (d) examination of alternative solutions and goals; (e) transformation of intentions into actual change efforts; (f) generalization and stabilization of a new level of functioning or group structure; (g) achieving a terminal relationship with the consultant and a continuity of changeability.

Bennis and Schein (1969) suggest that the role of change agent includes the following elements: He is a professional, guided by certain ethical principles, and acting in the client's interests rather than his own; he is marginal, without formal membership in the target system and often without the immediate supporting presence of colleagues; his role is ambiguous, not widely understood, often lacking in legitimacy and credibility, sometimes viewed with suspicion and hostility; his role is insecure—he may be considered expendable, there are few guidelines for his actions, and he is almost certain to encounter resistances; and his role is potentially risky, both to the target system and to his professional status.

Havelock (1970) weighs the relative advantages of the internal change agent versus the outside consultant. The former has immediacy in his knowledge of the problems and has commitment; the latter is more likely to have perspective and expertise. The insider may be handicapped by past enmities, the outsider by being perceived as a stranger.

Mackie (1974) stresses the importance in increasing application potential of (a) collation and interpretation of research; and (b) the translation of research into practical terms. He considers the especially trained middleman as essential to the performance of these two activities.

The job of the change agent, then, would appear to be difficult and demanding. According to Bennis and Schein (1969), the competence of the change agent should encompass: conceptual diagnostic knowledge cutting across all behavioral sciences; knowledge of theories and methods of organizational change; knowledge of sources of help; orientation to the ethical and evaluative functions of the change agent's role; possession of operational and relational skills; recognition of his own motivations.

In a paper designed to develop a model of change

management that might provide change agents with a managerial approach in directing social change, Kaufman (1972) presents, with charts, a change management system that comprises organizational, communications, and change target subsystems.

Burke and Schmidt (1971) point out that the change agent may function in the development of either the organization or the manager. They assert that staff requirements are more severe in the case of the former; the practice of organizational development requires a wider range of skill and knowledge than does the development of management.

Consultation. Beckhard (1971) describes the process of consultation as entailing: (a) initial contact by the client system; (b) defining the problem and establishing the relationship; (c) planning the first action steps; (d) assessing the facts; and (e) replanning and reestablishing the relationship. As a result of experience in a given case situation, he concluded that:

1. It is necessary to establish a relationship with the several parts of the system before any effective problem solving can get under way.
2. It is important to establish a climate and procedures for feedback, both between the helper and the client system and among the parts of the client system.
3. The readiness and capacity of the client system to change needs to be assessed by the consultant.
4. Since the change situation is primarily one of learning, the consultant should create conditions that favor learning.
5. Help offered should be in terms of client, not consultant, need.
6. The consultant should be able to withdraw from the relationship, if necessary, to permit independence.
7. Provision should be made for evaluation.

Argyris (1969) analyzes the often tenuous position of the consultant who may face difficulties because of his marginal place in an organization. The invited consultant frequently has to straddle a series of overlapping, conflicting, and at times antagonistic subcultures.

Organizations should develop a climate where consultants can express their values. Conditions that promote a good relationship for the consultants include: (a) may never become part of line management; (b) may have their own professional salary scale as do medical directors; (c) may never be fired for focusing on such processes as openness and authenticity; (d) may be dismissed if they are judged by their professional colleagues to be incompetent.

Distinctions as to types and levels of change that may be of concern to change agents are referred to by several authors. For example, Morgan (1972) distinguishes among four types of change: (a) in technology; (b) in working methods; (c) in organizations; and (d) in people.

Beckhard (1975) differentiates among organizational targets that may be stressed by a consultant by listing the following ongoing social processes that may be affected:

1. Interaction among individuals.
2. Interaction among groups.
3. Procedures for transmitting information, making decisions, planning actions, and setting goals.
4. Strategies and policies guiding the system, the norms, or the unwritten ground rules or values of the system.
5. Attitudes of people toward work, the organization, authority, and social values.
6. The distribution of effort within the system.

He also distinguishes between *early intervention* and *maintaining change.* In the former aspect, he suggests a number of possibilities as to where or how to start, such as: with the top team in the system, with a pilot project, with hurting systems, with the reward system, with educational interventions, and the like. An organization-wide confrontation may prove helpful in determining the first steps toward improvement.

With respect to maintaining change in a large system it is necessary to have conscious procedures and clear commitment. Among a number of interventions that are possible at this stage, perhaps the most important single requirement is for a continued feedback and information system, including such elements as: periodic team meetings, organizational meetings to sense needs, problems, opportunities—or employee perception and opinion surveys for this purpose, meetings between interdependent units of the organization, renewal conferences, performance reviews, and periodic visits from outside consultants.

Four types of consultation are outlined by G. Caplan (1970):

1. Client-centered case consultation, in which the consultee and consultant discuss a particular case or group of cases.
2. Consultee-centered case consultation, which focuses on the consultee's difficulties in handling a case or cases.
3. Program-centered administrative consultation, which aims at planning or improving a program.
4. Consultee-centered administrative consulta-

tion, which deals with organizational difficulties, such as leadership or communication problems.

Caplan differentiates consultation from other specialized methods such as supervision, education, psychotherapy, casework, and counseling, regarding it as the interaction between two professionals concerning a lay client, or program for such clients. He sees it also in an institutional sense, as when he discusses steps in formulating a consultation program in a community. The building of relationships, whether it be with an institution or an individual, is considered to be of paramount importance. He notes that working with a community requires different theory and techniques from those used with formal organizations. He offers several approaches that mental health workers might use in the face of community conflicts and confrontations.

In discussing the teaching of consultation, Berlin (1964) states that mental health consultation is different from consultation in agencies of an educative or technical nature. Mental health consultants need to unlearn generic methods and acquire an indirect method of helping an agency worker with problems produced by internal conflicts. Consultant-anxiety is an expected part of the process because of the many and varied implicit and explicit demands of the consultee. Administrators may be particularly difficult to engage in consultation because they may see it as a threat to their facade of adequacy. Problems of teaching center around helping the trainee to live through the inevitable frustration as he learns a new technique.

Applicational fields. In the vocational rehabilitation field, the linkage role has found expression in the form of the *Research Utilization Specialist* (RUS). Usdane (1971), summarizes development of the RUS linkage role, noting that it was necessary to provide specific training to enable the RUSs to acquire skills in teamwork, orientation toward problem identification and solution, and sensitivity toward and knowledge about resources useful in efforts to improve services to the disabled. Goals for the RUSs were defined by Riley et al. (1968) as follows: (a) to assess existing or foreseeable needs in the field or in the state agency; (b) to identify usable research results; (c) to bring them to the attention of practitioners; and (d) to promote the application of worthwhile research findings to the improvement of services to the handicapped.

RUSs were installed in nine state vocational rehabilitation agencies to achieve these goals, with demonstration project funding provided by the Social and Rehabilitation Service from 1969-1974. Six of the nine RUS programs were successful enough to warrant continued funding by their host state agency, beginning in June 1974. Activities of the RUSs have been described by Hamilton and Muthard (1975).

A three-year evaluation study of the national RUS demonstration program was conducted by Glaser and Backer (1974a). The evaluation research included two series of field visits to the nine project states, plus a national questionnaire survey to learn what impact RUSs had on rehabilitation personnel. Results of the Glaser and Backer study suggest that RUSs have indeed had impact on the operation of their host agencies, particularly in setting up information-dissemination systems, and in facilitating actual service improvements through small-scale change projects based on exemplary R&D findings. RUSs also faced many barriers and constraints to effective utilization of new knowledge: lack of financial resources, resistance by practitioners to use of research findings, diversion of the RUS's energies to nonutilization work required by his superiors, and poor definition of the RUS's role at the outset of the demonstration.

Following the end of the five-year demonstration period, a conference was held to encourage additional state vocational rehabilitation agencies to adopt the RUS model. Fifty-five persons representing 30 state agencies attended this meeting, and at least five adaptations of the RUS model followed after the conference (Glaser & Backer, 1975). Recommendations for implementing an RUS in service delivery settings were formulated as part of the evaluation study (Glaser & Backer, 1974b).

Increasingly, the federal government has sponsored the knowledge-linking agent/specialist role. Glaser (1973) remarks that "with the advent of revenue sharing, there has come into being a new partnership between the federal government and the states and localities." This partnership suggests that the federal government will be assisting state and local governments to develop their capacity to assess and assimilate scientific R&D knowledge applicable to local needs.

The concept of knowledge production, once confined to the researcher, is broadened by Short (1973) to cover the *integrator*, who as a synthesizer or interpreter brings together findings of a large number of studies; the *translater*, who identifies particular operational problems and invents solutions by transmitting, translating, or transforming already existing solutions; and the *knowledge linker*, who bridges the gap between researcher and

practitioner. He adds that the roles are not mutually exclusive.

Havelock (1973b) notes that school superintendents report a great deal of innovative adoptions in school districts, but the utilization of innovative resources is uneven. For example, the influence of universities and other outside formal agencies was less evident than that of certain internal factors.

The Battelle Columbus Laboratories study for the National Science Foundation (1973) in exploring the many factors that influence the decisive events leading to technological and scientific adoptions, concludes with the belief that innovation cannot be completely controlled or programmed by a change agent. While the research knowledge "gatekeeper" and the technical entrepreneur both exerted some influence on adoption, a number of factors (see Chapter II) were found to be higher on the list of determinants of change.

The role definition of change agents is treated in detail by Havelock (1973a), who has prepared a guide for people working for reform at all levels of the educational system. Change agent roles are discussed, including those of process helper, catalyst, advocate, solution-giver, and resource linker. The change agent is viewed as being involved in six stages of the change process which are designated: (a) relationship; (b) diagnosis; (c) acquiring relevant resources; (d) choosing the solution; (e) gaining acceptance; and (f) stablizing the innovation and insuring self-renewal.

Training of change agents. In a companion work, Havelock and Havelock (1973b) take up more specifically the *training* of change agents, particularly in the field of education. The topics included are as follows:

1. Our contemporary knowledge of the change process.
2. Goals of training.
3. Some principles of good training design.
4. A framework for training designs.
5. Self-renewal within the school system.
6. Linking schools to outside resources.
7. Effecting political and structural change in schools.
8. Changing the larger system.
9. Sample model of a fully developed training design.

That the book is an outgrowth of a conference of 50 nationally known leaders in the field of training and educational change is evidence of the expanding acceptance of the work of the change agent.

The causes of deficient planning and hence sources of error in the training of social change agents in Israel are presented in detail in Kahneman and Schild (1966). Most of the factors associated with deficient planning represent misconceptions in the agents' implicit theory of human behavior. Thus, for example, there is a tendency to overemphasize formal as against informal social structure. Perceptions of motives tend to be stereotyped and undifferentiated. Conformity pressures are insufficiently recognized, as is the need for status on the part of changees. It is asserted that these and other sources of error can be reduced through specific training.

Two types of patterns for utilizaton of social research are described by R. Lippitt (1969a): (a) bringing into the science consumer system knowledge and validated practice from *outside* the system for use in solving problems; and (b) developing scientific knowledge *within* the system in order to utilize it as a basis for improvement of practice. Three extra-system patterns and three inner patterns are spelled out. Training of linking agents must include new skills needed for utilizing these six patterns.

Harrison and Hopkins (1969) present a detailed analysis of the inadequacies of conventional American higher education for training change agents where the ability to adapt to or act in unfamiliar and ambiguous social situations is required. Included in this category are all types of community development or community action work, at home or abroad. Principles embodied in a suggested inductive approach are listed:

1. Exposure to situations which require diagnosis, definition of problems, devising solutions, and taking action.
2. Immediate data orientation as distinguished from second-hand and abstract sources of information.
3. Exposure to situations where competing cultural values are involved.
4. Experience and action as distinguished from understanding only.
5. Use of authority to promote experimentation, risk-taking, and self-expression in the learner.
6. Use of expertise to teach problem-solving processes rather than supplying information.

Thus, the roles and functions of the change agent have been the subject of much discussion and study. He goes under various titles and operates in different status positions. His work relates to persons at various points in the continuum from knowledge or research production to practical application. His degree of aggressive participation in enterprises varies. He needs to undergo training for his work, and needs to be expert in training others in their functioning. His influence is variously

transmitted through cognitive knowledge transfer, attitudinal reeducation, and behavioral performance modification. He may be part of the knowledge-producing system. the knowledge-user system, or both systems, not to mention the contextual social system. In short, he is a catalyst of change, and a potentially powerful linking force in the continuous effort to put knowledge to practical and innovative use.

CHANGE AGENCIES

Many of the functions and activities of change agents have been institutionalized in the f "m of recognized change agencies of one kind or another. The importance that agencies of various kinds can play in "building capacity for renewal and reform" and in stimulating knowledge production and utilization is indicated in a report of the Task Force on Resources Planning and Analysis of the National Institute of Education (NIE) Office of Research and Development (National Institute of Education, 1973). The report is designed to describe the initiative of the Institute in its attempt to build organizational capacity of the R&D community: to create information and alternative practices and products of value to educators, to increase the capacity of a variety of agencies to link research to practice, and to enhance the capability of schools and state agencies to engage in a process of continuous improvement that makes the most effective use of local resources as well as products of external R&D. The report presents a series of recommendations under four categories:

1. Developing a monitoring system within NIE
2. Strengthening the external R&D system
3. Building a linkage and support system
4. Building problem-solving capacity in the operating system

The underlying philosophy expressed by the Task Force is evident in its belief that "the revised concept of the 'R&D system' must include attention to how and by whom problems get formulated in the first place; to what might be a range of likely resources for solving them, whether through systematic external development or some other means; and to the organizational life of operating systems which will affect the possibility of implanting the solution to a problem."

The Pilot State Dissemination Program (referred to earlier in this chapter) was established in 1970 to try out an educational extension and retrieval system on a scale large enough to derive guidelines for future State-level projects. The employment of field agents in several states is reminiscent (on a less extensive basis) of the extension program of the Department of Agriculture (Sieber et al., 1974).

The concept of the Research Utilization Laboratory as a change agency has been sponsored by the Social and Rehabilitation Service, according to Usdane (1971), to select approved and effective research outcomes within a certain category, adapt them to a laboratory setting, and with at least one other similar agency, replicate the findings. The major concern is to simplify the recommended procedures and to make innovations more widely adaptable. The laboratories established have been essentially field-testing stations where outcomes of significant research are incorporated into ongoing service systems with a minimum of additional staff.

Engstrom (1970) also describes the work of the Social and Rehabilitation Service as an agency whose mission has included the dissemination of new knowledge and the stimulation of research utilization and program change. A Task Force on Research Utilization in 1966 made some 13 recommendations, 11 of which were adopted. Among these were publications and demonstrations bearing on practical applications of research.

The program mechanisms of the U.S. Environmental Protection Agency (EPA) operating as a technology transfer agent are outlined by Crowe and Madancy (1974) to include the following:

1. Organization mechanisms:
   a. The Technology Transfer Program functions as an office in the EPA's Headquarters Research and Development Organization.
   b. Each of 10 EPA regions has a contact man for technology transfer.
2. Production mechanisms:
   a. Needs are identified.
   b. Careful evaluation is employed with respect to technology transfer products.
3. Dissemination mechanisms:
   a. Dissemination process is accomplished by means of Headquarters staff and budget.
   b. The process is controlled to assure rapid and efficient response to requests from users.

Employing a set of "maximal" criteria derived from a "problem-solving dialogue" model, Havelock and Lingwood (1973) made a detailed analysis of the four following important research dissemination and utilization agencies:

1. Division of R&D Utilization, Manpower Administration, U.S. Department of Labor.
2. Research Utilization Branch, Social and Rehabilitation Service, U.S. Department of Health, Education, and Welfare.

3. Mental Health Services Development Branch, National Institute of Mental Health, U.S. Department of Health, Education, and Welfare.
4. National Center for Educational Communication, Office or Education, U.S. Department of Health, Education, and Welfare, later transferred to the National Institute of Education.

The studies included interviews with staff, questionnaires, documented conferences, and literature survey. Criteria were applied to six areas of consideration:

1. User self-service.
2. Need processing.
3. Solution building.
4. Solution processing.
5. Microsystem building.
6. Macrosystem building.

Recommendations for the improvement of the several agencies in each of these areas are provided.

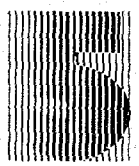
As the Coordinator for Educational Communications, Bureau of Elementary and Secondary Education, U.S. Office of Education, Hearn (1971) is concerned with the linkage of research with educational practice. He raises three questions regarding the role of various agencies in this regard:

1. Can the roles of universities and colleges be articulated and coordinated so as to develop mutually supportive systems?
2. Can the efforts of various units in the U.S. Office of Education and related educational agencies be coordinated so as to provide a national focus?
3. Can the state educational agencies fulfill a knowledge utilization role by taking the leadership in evaluating, validating, and disseminating promising programs?

Burchinal (1967) proposes that in addition to information services such as ERIC, there is need for small *local information services*. These would be staffed with information specialists who would be familiar with all the large information services, would know the operational requirements of the systems, would act as intermediary between the user and the systems, and be able to give feedback to the systems about information requirements of the user.

While not representing change agencies in the usual sense, two well-supported commissions on mental health sponsored by a host of mental health associations and organizations as well as by the federal government have served as powerful forces for change. These are: the Joint Commission on Mental Illness and Health (e.g., Robinson et al., 1960) and the Joint Commission on Mental Health of Children (e.g., Joint Commission, 1969, 1973a, 1973c). Hundreds of specialists were involved in each case, comprehensive surveys were undertaken, and scores of recommendations were made in the two sets of reports. Although one-shot affairs, they carried out on a grand scale the monitoring function so often associated with change agencies.

An indispensable reference tool for those seeking information about research utilization programs within the federal government is the *Directory of Federal Technology Transfer* (1975), prepared under the auspices of the Federal Council for Science and Technology's Committee on Domestic Technology Transfer. This volume presents capsule summaries of virtually every currently operating unit within a federal agency that is concerned with application of R&D findings or spread of existing technology. Both hard sciences (Department of Defense, Energy Research and Development Administration) and social sciences (National Institute of Education, Manpower Administration) are included. Each summary presents a brief history of the technology transfer program, its current staffing and funding status, and a description of service efforts or research studies it has undertaken. The name and address of a contact person from whom further information can be sought also is provided.



THE SEARCH FOR MODELS OF KNOWLEDGE UTILIZATION

Types of Models Illustrated

Much of the literature on the subject deals with empirical and applicational ideas and suggestions. At the same time, there is evidence of a strong interest in digging into the underlying principles upon which practical suggestions may be based, and in building systematic models of the utilization process.

It is true that the term "model" is used in a number of different senses, and that the model-building enterprise is in a fluid state. In attempting to put models to work, it is well to remember that they do not necessarily represent established laws. Ordinarily the model builder draws on theory, experience, and, to a degree, validated evidence concerning relationships of one kind or another; but the model itself is to be judged in terms of its fruitfulness in leading to useful knowledge and dependable outcomes, and it is not in any *a priori* sense offered as reflecting truth itself.

In some instances the model refers to the statement of selected, separate factors or variables deemed important to one or more phases of the process of research or knowledge development, dissemination (or diffusion), and utilization. One may infer that those who confine their attention to this relatively restricted use of the concept of a model reflect a down-to-earth concern with either empirical proof or concrete applicability, or both, with respect to the characteristics that bear on effective research utilization.

In other instances the models go further in connecting the specified elements, but do little more than arrange the elements in a series of steps or stages through which a process of utilization may proceed. This too, is useful in directing one's attention in an orderly way toward the examination of the components of a generally complex phenomenon.

Other users of the model concept go still further into systematic consideration of research utilization by applying theories and models borrowed from related disciplines, such as communications theory or social psychology, to elements of the utilization process.

Finally, a number of models found in the literature reflect in varying degree the constructs and principles of systems theory, particularly as it bears on dynamic, transactional relationships among system elements.

SEPARATE FACTORS OR VARIABLES

Many of the studies in Chapter II of the present document reflect the use of the model concept in the first sense; that is, they serve to identify certain key variables, grouped perhaps, but not described as dynamically interrelated or connected with underlying principles, except by implication. These listings of variables, nonetheless, are not the result of casual choice; one can readily "read between the lines" to sense, in most cases, a good deal of theoretical underpinning. Thus, in the case of the A VICTORY list of change factors proposed by Davis (1973), the author indicates its basis in a behavioral model of change adapted from learning theory (later to be described). In conjunction with the CORRECT list of project variables (Glaser, 1973), concepts from social psychology, cognitive psychology, and management theory are in evidence. The H-E-L-P S-C-O-R-E-S set of project change variables (Havelock & Lingwood, 1973), which incorporate elements espoused by Havelock (1969a) and by Rogers and Shoemaker (1971), is related to analytical models developed by these authors. The Battelle Columbus Laboratories (National Science Foundation, 1973) list of 21 factors of probable importance to the direction and rate of innovative adoption processes were selected from the general literature, and hence relied on more diverse theoretical sources, but the very nature of the items suggests the influence of motivational theory, management theory, interpersonal psychology, and social theory.

Employing an empirical, factor-analysis approach, Havelock (1974b) attempted to relate judgments concerning the importance of various innovative procedures, as made by school superintendents, to certain formulated models of the research development-to-utilization spectrum.

And so with many of the organizational variables referred to in Chapter II. Here one recognizes the behind-the-scene influence of organizational theory, management theory, interpersonal psychology, motivational psychology, psychology of thought processes, social and political theory, communications theory, and industrial psychology.

The tenets of personnel psychology are seen in the discussion of personal variables affecting innovative behavior. While these variables are not

ordinarily treated in an organismic, clinical fashion, dynamic implications can at times be seen behind the essentially "trait-type" treatment of the subject.

PROCESS ELEMENTS OR STAGES

The opening pages of Chapter III of the present document illustrate in good part a move into the second type of model building, namely the depiction of *stages* in the research utilization process. Thus, the introductory chart showing the stages of successful organizational change based on the work of Lippitt et al. (1958), Jenkins (1962), Jung and Lippitt (1966), Watson (1967), Greiner (1967), and Rubin (1968) divides the process into recognizable stages akin to John Dewey's five-stage analysis of problem solving. Other stage-oriented presentations are referred to: Dewey's analysis tinged with psychodynamic considerations (Abelson, 1964); the four-stage analysis of organizational change by Hage and Aiken (1970); the ten stages of message communication by Paisley (1969); the five-fold listings of factors related to successful transfer of R&D findings by Glaser (1973); and a four-stage approach (analysis, goal definition, action, and follow-through) to the application of the A VICTORY change model (Davis, 1973; Davis & Salasin, 1975).

BORROWED-THEORY MODELS

Illustrations of models of the third type, namely those that reflect models or parts of models from related disciplines, often in the form of what might be called mini-models, may be found, for example, in the *Implementation* section of Chapter III. Here we find, for instance, an adaptation by Benne and Birnbaum (1960) of Lewin's model of social change. Chin and Benne (1969) borrow from social theory to give us a three-fold perspective on change strategies: (a) the *empirical-rational,* based on an assumption of the rational man; (b) the *normative-reeducative,* based on the view of man's relationship to his social environment; and (c) the *power-coercive,* based on the view of power as the source of all human action.

SYSTEMATIC MODELS

Perhaps because the subjects of linkage and dissemination lend themselves to the formulation of interlocking arrangements of elements and to interpersonal communication processes affecting the flow and feedback of signals, Chapter IV provides illustrations that reflect, along with other types, the model concept of the fourth type, namely that embodying the principles of systems theory. Among this type are the Havelock and Lingwood (1973) model used to describe four research and utilization linkage agencies, and the elaborate knowledge production and the utilization system of the National Institute of Education (1973), both of which will be further described at a later point.

Description of Knowledge Utilization Models

SIX WIDELY QUOTED MODELS

Six models stressing one or more phases of the research - development - dissemination - utilization continuum have received notable attention in the literature. The first three to be described have been set forth by Havelock (1969a), among others, and the next two by Sashkin et al. (1973), also among others. The sixth has been described in great detail in Havelock and Lingwood (1973). There is much overlapping of ideas among the models.

1. The first is the *research, development, and diffusion model.* This model assumes there is a relatively passive target audience of consumers which will accept an innovation if it is delivered through a suitable medium, in the right way, at the right time. It calls for a rational sequence of activities from research to development to packaging before dissemination takes place. It assumes large-scale planning, and requires a division of labor and a separation of roles and functions. Evaluation is particularly emphasized in this model, in which there is a high initial development cost and which anticipates a high payoff in terms of the quantity and quality of long-range benefit through its capacity to reach a mass audience.

2. The second is the *social interaction model,* which is more sensitive to the complex and intricate set of human relationships, substructures and processes that are involved in the dissemination phase, and which stresses the importance of face-to-face contacts. This model implies that a user can hold a variety of positions in the communication network, and that people tend to adopt and maintain attitudes and behavior which they perceive as normative for their psychological reference group. The size of the adopting group is basically irrelevant in this model, which follows essentially the process stages of knowledge and research diffusion, with appropriate influencing strategies used at each stage. The "configurational" theory model of Bhola (1965) later referred to may be said to fit under the social interactive perspective.

3. Third is the *problem-solving model,* which starts with the user's needs as a beginning point for

research, with diagnosis as an essential first step in the search for solutions. The outside helper, or change agent, in this model, is largely nondirective, mainly guiding the potential user through his own problem-solving processes and encouraging him to utilize internal resources. The model assumes that self-initiated and directed change has the firmest motivation and hence the best prospect for maintenance.

4. In the fourth model, the *planned change model,* information is considered useful only if it leads to action, and is shared between the change agent and the client. The assumptive basis of this model is that change occurs through a consciously controlled, sequential, and continuous process of data generation, planning, and implementation. The changes made need to be stabilized and supported.

5. The fifth model is the *action research model.* Although similar in some respects to the problem-solving and planned change models, it is most distinctive in emphasizing the development of research within the organization. The type of research and its methodology are influenced by its concurrent conduct with the ongoing activity of the organization. The results of the research, while primarily intended for the organization itself, may prove useful to others and contribute to behavioral science itself. The model assumes the action research to be a continuous process of research, action, evaluation, and more research.

6. The *problem-solving dialogue or linkage model* may be described in terms of four components: (a) the client or *user system,* represented diagrammatically by a circle at the right: (b) the knowledge or research *resource system,* represented by a circle at the left; (c) a *need processing* system, represented by an arrow leading from the user system to the resource system; and (d) a *solution-processing system,* represented by an arrow leading from the resource system to the user system. The first two, it may be noted, are problem-solving systems; the last two represent the dialogue between the first two.

One may designate the system as a whole, with all the relationships among the subsystems depicted above, as the province of *macrosystem building.* The process is termed *microsystem building* when one considers actions in which many elements of the problem-solving dialogue are present simultaneously and are permitted to interact on a small scale.

Each of the components of the total dialogue system can be analyzed in great detail, according to one's purpose. Correspondingly, any real-life system can be described in terms of the dialogue system, elaborated to any degree or expressed in any appropriate manner. Research surveys may be made to cover designated provinces of the entire system, and sets of recommendations can be generated concerning chosen parts of the model.

This model has been used as the framework for studying four federal research dissemination agencies (Havelock & Lingwood, 1973), for charting eight "operational modes" reflecting various possible emphases by a research development, dissemination, and utilization agency (Havelock et al., 1974a), in examining resource linkage in educational innovations (Havelock, 1973a), and in determining the extent to which highway safety research communication may be considered as representing an effective system (Havelock & Markowitz, 1973).

All six of the models may entail the use of a consultant. External data sources are used in the first two models. The problem-solving model uses internal data sources. The last three models employ both external and internal sources.

FUNCTION-TYPE FORMULA MODELS

Two models employ a function-type formula as the basis for expressing the relationship among operational elements.

1. Davis (1971, 1973, 1975) has formulated eight considerations, under the acronym A VICTORY, which have been found very useful as a framework for assessing an organization's readiness to seriously consider the adoption of new policies or practices, for identifying areas of possible nonreadiness that may need attention before directly embarking on a change effort, and for guiding implementation.

The A VICTORY formulation evolved from a behavioral model of change adapted from learning theory embracing such considerations as drive or motivation, the ability or capacity of the learner, and circumstances or stimulus conditions. Results from a number of experiments on adoption of innovations, as well as from literature surveys, have been matched with the behavioral factors.

The formula is:

$$\mathbf{B\ (behavior)} = \mathbf{E_s + T + S_c + (P + H_s)\ (DxC) - I}$$

In the equation, E_s = self-expectancy; T = timing; S_c = stimulus conditions; P = pattern for behavior; H_s = habit strength; D = drive; C = capacity to perform behavior; and I = inhibitors.

The equivalencies of the A VICTORY factors with the terms of the formula are briefly stated as follows:

A (Ability) = **C** (Capability: relevant sanctions; fiscal, manpower and physical resources)

V (Values) = $\mathbf{E_s}$ (Self-expectancy: perceptions, personal beliefs and attitudes toward the innovation)

I (Idea)	**=P**	(Pattern: adequacy of knowledge about the innovative procedure, and idea for proposed action steps)
C (Circumstances)	**=S_c**	(Stimulus conditions: forces affecting the agency's reaction to change; circumstances that prevail at the time)
T (Timing)	**=T**	(Timing: synchrony with other significant events)
O (Obligation)	**=D**	(Drive: the felt need or motivation to act on the particular problem)
R (Resistances)	**=I**	(Inhibitors: rational or irrational fears and obstructions, as they are relevant to the desired change)
Y (Yield)	**=H_s**	(Habit strength: perceived benefits or rewards that the anticipated changes may bring about)

The A VICTORY factors are described more fully on p. 5.

2. A "configurational" theory of innovation diffusion has been proposed by Bhola (1965) which can be stated as a function (f) in accordance with the following formula:

$$D = f(C_{it}LER)$$

where Diffusion (D) of innovation is a function (f) of the Configuration (C) relationship between the Initiator (i) from a class of such initiators and the Target (t) from a class of such targets: the extent and nature of Linkage (L) between and within configurations; the Environment (E) in which the configurations are located; and the Resources (R) of both the initiator and target configurations. (An initiation configuration acting on another target configuration together make a configurational relationship, symbolized by C_{it}.) Bhola also suggests that the initiator (i) and the target (t) configurations may need an articulating force, an adapter (A) that either overlaps or bridges the gap between the initiator and the target.

This theory, like that of Davis' (but not nearly so easy to apply as Davis' A VICTORY factors), serves to draw the attention of producers and users of knowledge, in a systematic fashion, to components of the diffusion or adoption processes.

THE NATIONAL INSTITUTE OF EDUCATION MODEL

According to a National Institute of Education Task Force on Resources Planning and Analysis (National Institute of Education, 1973), the underlying model of the Institute calls for the coordinated operation of four subsystems: (a) a monitoring system; (b) an external R&D system; (c) a linkage and support system; and (d) an internal, problem-solving operating system. The last named is the school system, in which, it is posited, a good deal of problem-solving activity occurs—aided and abetted by the other subsystems of the Institute. Hence the interest in "how and by whom problems get formulated in the first place" and "the organizational life of operating systems which will affect the possibility of implanting the solution to a problem."

Some of the considerations affecting the program and plan of the National Institute of Education may be noted:

1. The literature on social indicators provides a source for use in the monitoring system, as does multidisciplinary knowledge. Surveys of educational practice and R&D impact thereon represent the subject matter of the monitoring process.
2. The tendency of R&D models to borrow from the "hard sciences" may not be suited to the needs of complex social situations. A concerted series of long-range and short-range programs and projects is necessary to the realization of the system's R&D mission.
3. The building of the linkage and support system requires a consumer information strategy, an information dissemination strategy, and a product delivery strategy.
4. In building problem-solving capacity in the operating system, it is necessary to provide support at the teacher level, the school level, the school district level, and the school/community level.

The model clearly encourages widespread involvement in the educational improvement process, emphasizes a problem-solving approach, and calls for well-supported, coordinated effort.

MISCELLANEOUS CONTRIBUTIONS TO MODEL BUILDING

In the discussion that follows, the term, model, is used in a broad sense to represent approaches, strategies, or ideologically connected sets of techniques, as well as models in their full-blown meaning.

It has been noted that the process of model building with respect to research utilization is in a fluid state. The literature abounds with many ideas that may prove helpful in carrying the process to a higher level of integration and to greater fruitfulness of conceptualization. Some of the additional notions regarding model building that have come to light in the preparation of the distillation are presented below.

1. Several writers sought to set down the *types or categories* of *models*.

a. According to Chin (1969), there are two major categories of models the practitioner may use as a diagnostic tool for planning change: the *systems model* and the *developmental model.* Chin defines the major terms used in each type of model. For the systems model these include: system; boundary; tension, stress, and conflict; equilibrium and steady state; and feedback. The terms defined in conjunction with the developmental model are: direction; identifiable state; form of progression; forces and potentiality.

Chin raises five questions regarding the relationship of the change agent to the model:

- Does the model account for stability and change?
- Where does the model locate the source of change?
- What does the model assume about the determination of goals and directions?
- Does the model provide levers for effecting change?
- How does the model place the change agent in the scheme of things?

Each model is examined in the light of these questions. Chin asserts that a third model for change is emerging, one that incorporates features from both the systems and developmental models. In this model, direct attention is paid to the induced forces producing change.

b. Bennis (1963) refers to three approaches to planned organizational change: (a) the *equilibrium model,* according to which the mechanism for change is tension release through anxiety reduction; (b) the *organic model,* in which the mechanism for change is power redistribution and conflict resolution; and (c) the *developmental model,* whereby the mechanism for change is the transformation of values.

All three approaches have a deep concern with applying social knowledge to create more viable social systems, a commitment to action, as well as a research role for the social scientist, and a belief that improved interpersonal and group relationships will ultimately lead to better organizational performance.

c. Hage and Aiken (1970) distinguish between the "*mechanical model*" and the "*organic model*" commonly referred to in the sociology of organizations in describing two "ideal" types of organizations manifesting, respectively, "static style" and "dynamic style", reflecting a distinction between slow and fast change as well as between stable and unstable environments.

d. Zaltman et al. (1973) present their model, or theory of the innovative process at the level of the organization, as distinguished from that of specific innovative ideas, practices, or material artifacts. A major feature of their model is an attempt to relate organizational factors of complexity, centralization, interpersonal relations, and capacity for dealing with conflict to the initiation and implementation stages of the innovation-adoption process. They also relate some 19 attributes of innovation to the decision stages through which an innovation progresses. (See Chapter II, page 7.)

e. In his discussion of the diffusion of innovations with special reference to social change, Schon (1971) distinguishes between the center-to-periphery model and the more recently developed systems model. This difference is related to Schon's analysis of the shift in business firms from instances in which the unit of innovation was a product or technique to those involving a functional system. The greater complexity of the latter conception implies a state and feeling of uncertainty in man's role and the presence of strong, concurrent dynamic forces directed toward maintaining conservatism. To counteract the discrepancy between man's inner stability needs and the demands of changing situations, Schon stresses the importance of the development of effective learning systems in government and in society in general.

f. Organizing for social change is treated as a major section of the book of readings by Zaltman et al. (1972). Rothman (1968) sets forth the characteristics of three models of community change: (a) locality development; (b) social planning; and (c) social action. The theme of social action is developed in an article by Pruger and Sprecht (1969), as a case in point, and also by Dubey (1970), who stresses community action programs and citizens' participation.

g. In their introductory statement to an overview of social change Zaltman et al. (1972) identify six types of social change according to a grid reflecting a short- and long-term dimension on one axis, and a threefold distinction as to level of society (micro, or individual; intermediate, or group; and macro, or society) on the other. At the individual level, Type 1 refers to short-term attitudinal or behavioral change, while Type 2 implies a change in life

cycle. At the group level, Type 3 deals with short-term normative or administrative change, while Type 4 relates to organizational change. At the societal level, Type 5 encompasses short-term invention-innovation or revolution, while Type 6 signifies long-term socio-cultural evolution.

2. A number of writers have presented *models depicting particular aspects of the research development, dissemination, and utilization process.*

a. Glaser and Ross (1971), for example, identify four models of advocacy formation: (a) the fiat model; (b) the platonic (rational appeal) model; (c) the apostolic model; and (d) the conversion model.

Advocacy by fiat, or change by force of power, administrative regulation, or law, leads to change resulting from decisions of those in authority, as in military, hierarchical, and bureaucratic organizations.

The *platonic model* assumes that potential users can be persuaded through education and rational appeal to use particular research-based information or innovative procedures. As evidenced by both Fairweather (1973) and Glaser and Ross (1971), this approach apparently leads to intellectual adoption more than to behavioral modification.

The *apostolic model* attempts to stimulate conviction and motivation toward behavioral change through testimony and personal presentation and discussion in addition to written persuasion. Glaser and Ross (1971) found that many potential innovators appeared to appreciate intellectual stimulation afforded by such discussions, but the discussions did not necessarily dissipate the participants' doubts concerning implementation.

The *conversion model* has a stronger emotional component, seemingly based on a more profound re-ordering of the conceptual frame of reference, with conversion facilitated by first-hand participation in an experience with a mutually reinforcing group of peers.

b. Fairweather (1971) has developed a *model of experimental social innovation.* In his delineation of the attributes of social innovative experiments, he starts with the *definition* of a significant social problem; this process includes engaging in naturalistic field observations (diagnosis) to describe the parameters of the problem in its actual community setting. The next step, *innovation,* creates and formulates different solutions as innovative subsystems. These subsystems then go through the process of *comparison,* whereby an experiment is designed to determine the efficacy of the different subsystems in solving the social problem. The innovative subsettings are implanted in appropriate social contexts so that they can be evaluated in their natural habitat. In the *evaluation* phase, the subsystems are continued in operation for several months or even years to allow for adequate outcome and process evaluation.

Throughout, participants in the subsystems are responsibly included, and a cross-disciplinary approach is employed, the social problem determining the fields and subject matter encompassed. Fairweather et al. (1974) consider social innovative research to be the only humanitarian approach with social subsystems in which individuals function. While the model utilizes research in a natural setting, it follows the logical stages of (1) concern; (2) diagnosis; (3) formulation of alternatives; (4) implementation; and (5) evaluation.

c. *Scientific communication as a system* is summarized by Menzel (1966c) under five topical statements:

- Acts of scientific communication constitute a system.
- Several channels may act synergistically to bring about effective transmission of a message.
- Informal and unplanned communication plays a crucial role in the science information system.
- Scientists constitute publics.
- Science information systems serve multiple functions, including exhaustive search, reference, research stimulation, and scientist re-education.

d. The Unco, Inc. study (Unco, Inc., 1973a) of the utilization of four advanced management techniques in state welfare departments attempted to incorporate a communication model into an adaptation of the problem-solving model of research utilization. From the combined model and from interviews with welfare personnel in three states, the investigators devised a set of 25 principles of research utilization which they subsequently presented in a separate report (Unco, Inc., 1973b). These principles, or guidelines, deal with various aspects of the communication-utilization process.

With regard to the utilization cycle, the guidelines draw attention to the awareness of user need and to the articulation of the problem, to the necessity to choose solutions with-

in the constraints of the user's organization, ones that are responsive to economic, political, and social conditions, and that are technically valid. Demonstrations need to be realistic as well as technically valid, and to be responsive both to the user's methods of operation and to changing situations. The same is true of the implementation stage proper, following demonstration. User involvement and contingency planning are also stressed.

With respect to the communication cycle, the content of the messages needs to be clear to users of innovations, although excessive communication should be avoided. Suitable language needs to be employed, and written messages used with a realization of their limitations. A well-specified communication structure is critical for effective communication. Definite links must be provided, and feedback made an intrinsic part of the process. The translator role is significant in achieving effectiveness.

e. Shannon's *information theory* is used by Dahling (1962) to illustrate the spread of an idea through an amazing number of disciplines, including: computer science, electronics, psychiatry, psychology, engineering, educational psychology, biology, physiology, radar, linguistics, biosociology, library science, optics, education, statistics, social science, and journalism, in the order enumerated.

f. The application of *sociometry* to a communication network is employed by M. Becker (1970a, 1970b) in his study of the diffusion of innovation among health professionals.

g. Stiles and Robinson (1973) depict three models of educational change: (a) the *political process* model; (b) the *research and development* model; and (c) the *systems analysis* model. Flow charts are presented for each of the models.

3. Several writers have furthered the work of model building by setting forth quite fully the *component topics and elements* that need to be considered in developing a systematic model.

a. One report of this type is the book by Lippitt, et al. (1958), which presents a development in detail of the following six elements that go into the dynamics of planned change:

- Problems of internal relationship within client systems.
- Problems of external relationships of client systems.
- Change forces and resistance forces to which client systems are exposed.
- The role of the change agent.
- Phases in the process of planned change.
- Specific "helping methods" applicable to each phase.

The authors stress the need for a unified theory of change and changeability.

b. A recent, succinct summary of many of the facets of the knowledge transfer and institutional change process is offered by Glaser (1973). His factor categories include the major components of a comprehensive model:

- Characteristics of the innovation.
- Characteristics of potenial users.
- Manner and extent of dissemination.
- Facilitating forces.

c. Stressing a taxonomic approach, Kotler (1973) has organized his presentation of the elements of social action under five categories: (a) causes; (b) change agencies; (c) change strategies; (d) channels; and (e) change targets. By combining elements from each of the five categories, patterns of change situations may be specified. A useful chart lists the elements under each rubric and suggests a flow from the first, namely *cause*, to the last one listed, namely *change targets*.

d. The Kotler paradigm is employed as the basis for organizing a large section of a book of readings on the creation of social change by Zaltman et al. (1972). Included in this section is a careful analysis by Rogers (1969) of the relations among change agents and clients.

A classic example of systematic exposition of elements that lend themselves to model building will be found in Hovland et al. (1953) in their treatise on communication and persuasion, in which they discuss the following components of the process:

- The communicator.
- The communication.
- The audience.
- Response factors.
- Emerging areas of research.

Each of the elements is analyzed in detail, and pertinent research is noted in relation to each.

f. Davis (1973) sets forth 12 characteristics that a model of change should have if it is to be of use in everyday organizational situations, noting that his A VICTORY model is an attempt to incorporate all 12 characteristics:

- The model, above all, should be practical.
- The parts of the model should be manipulable.
- Economy of use should be a primary consideration.
- Ease of communication is important.
- The model should be comprehensive.

- Synergism—the force of factors working together—is important to consider.
- The model should lend itself to intervening in phases.
- Differential investment in working with the components of the model should be possible.
- The model should call attention to how the change process influences the rest of the system.
- The model should be flexible and versatile enough to apply to different organizational systems.
- The model should provide a basis for a subsequent evaluation of the effectiveness of change.
- The model should recognize the humanness of the participants involved.

g. Presenting a model with special regard to early interventions in a large system on the part of a consultant, Beckhard (1975) sets forth the following four phases:

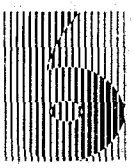
- *Defining the change problem,* including the organizational change needed or desired and the *type* of change desired.
- *Determining readiness and capability for change,* including motivation and capability, and entailing a diagnosis of dissatisfaction.
- *Identifying the consultant's own resources and motivations for change,* including congruence with organizational needs.
- *Determining the intermediate change strategies and goals,* including an indication of targets and measuring points en route to the larger change objectives.

With regard to the foregoing, Beckhard considers it important to examine the accessibility of each subsystem and the linkage of the subsystems to the system as a whole.

h. Rothman (1974) puts what is essentially a research retrieval-diffusion-utilization model to use in the very conduct of his extensive attempt to achieve a fuller utilization of social science studies relative to the planning and organizing for social change. The earlier stages of the model were actually employed by Rothman and his associates. The full model consists of the following components:

- A basic research pool is postulated.
- Retrieval, codification, and generalization activities are undertaken, resulting in:
- Consensus findings in the form of generalizations (abstract statements).
- Through a translation and conversion process there result:
- Generalized applicational principles (abstract statements).
- These are operationalized to yield:
- Applicational principles in delimited form (concrete statements).
- Initial implementation through field testing is attempted, resulting in:
- Practical and policy outcomes, refined and elaborated applicational principles, and the construction of diffusion media.
- Wide diffusion follows, leading to:
- Broad use in practice by clients, consumers, constituents, etc.

It is evident from the diversity of efforts in the search for effective systems models that the *nature* of such models, as well as their substance, has come under scrutiny. Though much progress has been made, the search for better models is likely to continue.



CONCLUDING COMMENTS

In preparing this report we have reviewed a large number of publications bearing on the general subject. Many of these are listed in the accompanying bibliography. From those listed, 267 have been summarized and are presented in the Summaries section of this volume. As might be expected, even those so selected vary considerably in the substantive basis submitted for the generalizations, conceptualizations or insights offered.

The studies and articles summarized in this document point up the complex interaction of the determinants bearing upon effective use of knowledge. At the risk of oversimplification, these determinants may be subsumed under four basic requirements: the innovation itself must seem relatively *worthwhile* to those who have the power to opt for adoption (for whatever reasons); and the innovative person, agency, or organization must be *able, willing,* and *informed* if the innovation is to be viable without the sustained imposition of external overpowering force. The scope of these four terms requires some stretching to include the many variables bearing on knowledge utilization.

It may be self-evident to note that the innovation must be found *worthwhile,* and if it is to be sustained, worthwhile by the test of time/experience. It must be effective for its purpose, generally more cost-effective than available alternatives for the same purpose, and reasonably "debugged" of significant negative qualities or undesirable side effects.

To determine worthwhileness, both formative and summative evaluations are useful. Conducted before (to establish baseline conditions), during, and after the implementation of an innovation, evaluation can offer needed evidence regarding whether a change is positive, is congruent with organizational or individual goals, and meets or exceeds expectations. It also can serve to identify problems or negative effects; if these are found, feedback of that information can be used constructively to bring about adjustments for improvement. Howard Davis* in fact cites the positive interaction effect between evaluation and change. In describing this effect he uses the term "targetropism," by which he refers to the evaluator's being drawn into the future, or into forward orientation, through the concrete, specific expectations surrounding evaluation, and this in turn facilitates the change process.

With regard to the *able* characterization, the persons concerned, whether as individuals or as extensions of an organization, must have the capacity for understanding and executing the proposed innovation. The individuals who are to "own" the new way of doing something must have the emotional commitment, feelings of security, openness of attitude toward and feeling of readiness for the change if it is to take root. The potential users must have the capabilities required to implement it. And potential user organizations or institutions need the leadership qualities and internal advocacy or "championship" necessary for sustaining new procedures or new forms of behavior. Evidence of greater efficacy than available alternative, habitual procedures often is not by itself sufficient. To adopt certain kinds of changes, organizations must have structures that can function effectively toward carrying out the tasks required for goal attainment, unhampered by (or able to get around) excessive bureaucratic inhibitors or external restraints. Similarly, the organizational climate, with the implications of that climate for reducing communication barriers, stimulating productive thinking and timely action, and sustaining employee concern for effective task performance, can contribute much to facilitate the innovative process. Further, the requirement of organization capability implies the ability to carry out the several stages or phases of the knowledge-utilization process. Whole sets of specific competencies are required for the successful execution of each step, from problem awareness to follow-through.

Willingness, the motivational sphere, has a number of ramifications. The user's goals, values, sensitivities, preferences, and interests are all involved. The potential user (or his organizational counterpart) must find the innovative project credible, relevant to his needs or wants, and seeming to possess some relative advantage over alternative ways of satisfying that need—to borrow from the CORRECT list of proposals by Glaser (1973). The A

*Stated at an NIMH-sponsored Conference for the Study of Evaluation and Planned Change, held at Palo Alto, California, February, 1976.

VICTORY list of Davis (1971, 1973, 1975) focuses on similar considerations, such as values, feeling of obligation to undertake the change, and yield. From the H-E-L-P S-C-O-R-E-S list reported by Havelock and Lingwood (1973) come such terms as: homophily, empathy, reward, and energy, which all relate to motivational considerations that influence the likelihood of adoption of a given innovation.

Motivational factors also are included in the set of probable influences on adoption of scientific and technological innovations as presented by the Battelle Columbus Laboratories (National Science Foundation, 1973). M. Becker (1970a) studying knowledge utilization by health professionals, and other investigators conducting similar studies in other fields, support the high place assigned self-interest, achievement drives, openness, and related motivational factors as influencing the acceptance of innovative proposals.

Information in this context would include a full range of content, from abstract to concrete and subjective to objective, as well as a full range of methods of presentation, from descriptive to comparative to analytical. It may derive from interpersonal contacts, printed materials, or personal experience. Once information is obtained, its appropriate dissemination provides the basis for linking research with practice. Thus, it would seem to be an obvious consideration that potential users should receive information concerning a projected innovation, yet studies show research centers and other agencies are not always effective in seeing that such information reaches the consumer, or that it does so in attention-arresting form. This has been noted in the case of low level of awareness on the part of many commercial firms about seemingly relevant NASA materials. Theoretically they might be expected to exploit the findings derived from the space program, obtained at tremendous expense and available through NASA (Greenberg, 1967).

Capability, willingness and *information* are closely linked. Insufficient motivation may inhibit informational linkage between researchers and users, but equally important may be the inappropriateness or the inadequacy of the communication media employed.

The role of the change agent or the change agency does not obviate the need for developers of promising new knowledge to think about how to increase the capability and the motivation of potential users of an innovative program to perceive its areas of relevant, cost-beneficial application. The efficacy of information flow is dependent in part on capability and motivation of both the developers/senders and the receivers of the information. The concept of motivation in this context suggests that information about a problem or about an innovation which might better solve a problem is not likely to be impactful—nor likely to be transformed into a felt "need" unless it (somehow) becomes charged with concern. To know *and to feel* are the ingredients likely to make for adoptive action. As long as knowledge is untouched by concern, there is no stake in what the knowledge reveals.

Model building offers further opportunity for examining the place of the fundamental factors of *ability, willingness* (including deliberate efforts to involve potential users as contributors or "co-architects" of the R&D effort), and *information* (including provision of technical assistance consultation, if desired, to assist in the process of introducing an innovation) in the research utilization process. It may suffice to note that each model or quasi-model assigns varying weight to each of the key elements. Of special interest, perhaps, is the observation that some of the models include provision, not simply for enhancing information flow, but also for increasing capability and willingness, particularly of potential users, and for cross-validating innovations to verify their efficacy under varied conditions of application.

Future Prospects

Despite an increasing store of practical wisdom concerning the subject of change, innovation, and knowledge utilization, as well as a recent expansion of an interest in conceptual models, there are many unexplored areas and untested fields.

What, then, is the state of the art and its prospects for the future? As previously noted, the summarized reports vary in character from statements of "conventional wisdom" to statistically or experimentally controlled empirical investigations. The resultant "findings" reflect this mixture of intuitive and objective inputs. One is left with the overall impression that whatever the underlying rational-intellectual basis for utilization behavior when innovations offer objective evidence of relative efficacy, there also is needed an essentially subjective overlay of sensitive interpersonal relations that serve as strong links between researchers-administrators-practitioners. That this is so can be gleaned, in part, from the character of proposals for the training of change agents or knowledge linkers.

Further, one may inquire as to the state of development in which the art finds itself. One is tempted to borrow a conceptualization from Piaget, namely,

to speak of the advice offered regarding research utilization strategies as reflecting the developmental stage of concrete operations. Pragmatic experience seems to lie largely at the base of the operative mode. And yet, there are evidences, as noted earlier, of excursions into operational thought embodying complex relationships, the use of abstract constructs and theoretical models, and the employment of research validation of hypotheses and theories.

Further conceptualization and additional empirical research seem both to be required and to be in the works, while at the same time there appears to be widening interest and increasing formal support in the matter of applying already known principles for putting knowledge to use.

With regard to conceptualization, the trend calls for further exploitation of ideas derived from systems theory. Already, a number of models of research utilization recognize the existence of subsystems and suprasystems among the phenomena of change and utilization processes. This is true in the case of the model reported by Havelock and Lingwood (1973), which, as previously noted, provides for a user system, a resource system, a need-processing system, a solution-processing system, a microsystem, and a macrosystem.

At the level of empirical research, there are countless specific topics that invite investigation. The number of empirical studies reported in the distillation is relatively small compared to non-empirical studies. And many of the empirical investigations could well warrant replication, if not in their original form, then modified in one way or another. Studies conducted with respect to one area of application may warrant repetition in each of a number of other fields. For example, in a study now in process by Hodgkin et al. (1975) which explores the value of developing a comprehensive, repeatedly refined state-of-the-art paper in the biomedical field contributed to by successive groups of potential users, there is evidence of very considerable impact in terms of interested response (requests for over 7,000 reprints within three months following publication, plus many letters of comment for interaction with the authors). If the strategy does prove useful for spreading "best known practices" in relation to this particular problem (diagnosis and comprehensive care for persons with chronic obstructive airway diseases), might it be equally useful for other biomedical problems such as arthritis, or for problems in education, rehabilitation, mental health, criminal justice, etc.? Numerous other differentiations in variables call for investigation. Untested hypotheses abound in the literature. In particular, there is a need for competent strategy evaluation studies.

Large-scale cooperative studies that tap the talents of seasoned researchers in the field of knowledge utilization seem especially promising. One such study sought to find out how three teams of specialists in problems of knowledge utilization might address a given problem (Edward Glaser and colleagues, Ronald Lippitt and colleagues, Everett Rogers and colleagues), first working independently, then coming together in conference. This approach was tried by Havelock in the course of an attempt to suggest an "ideal" research utilization pattern for the Social and Rehabilitation Service (Havelock, 1974a). The three approaches were both overlapping and different, with a good deal of integration growing out of the exposition and critical review of the separate position papers at a two-day conference.

Glaser (1973) has suggested what might be termed a strategy or "theorem" bearing upon research utilization that can have relevance to many fields of operation in our own society, namely:

> For any problem that is confronted by many individuals, groups, organizations or institutions, the range of response-effectiveness approximates the normal bell-shaped distribution curve. If we can identify the qualities that characterize the most exemplary practices—the upper 1-2 percent of that curve—and determine the *conditions* that seem to account for this relative excellence, we may find generalizations that perhaps can be applied or adapted by others, replacing the less effective modes of response. If so, the quality of life in many functional areas can be upgraded rather quickly. At the same time, even the best available knowledge and practice may be deficient in various ways, thus calling for a continuing search for new and greater knowledge.

This concept and strategy seem to have promise for facilitating the spread of relatively superior ways of dealing with many existing problems. Merton (1962) offers a related observation:

> In the world laboratory of the sociologist, as in the more secluded laboratories of the physicist and chemist, it is the successful experiment which is decisive [if it can be cross-validated] and not the thousand-and-one failures which preceded it. More is learned from the single success than from the multiple failures. A single success [of a controlled experiment, not a chance hap-

pening] proves it can be done. Thereafter, it is necessary only to learn what [conditions] made it work.

Finally, the monitoring, in the sense of federal agency support of research on research utilization itself, is much needed and has been manifested in the past few years. Monitoring should prove useful in establishing priorities for evaluation of RU efforts and "plowing back" what is learned into the various stages of the R&D process. It may be carried out with governmental and nongovernmental agencies, and perhaps lead to the development of new R&D support systems—for client-users and for the R&D community. Increased availability of technical assistance consultation, or further linking-agent service between researchers, practitioners and administrators may well result.

The contemporary pace and scale of change in our society may continue to accelerate, as Toffler and others have suggested. If this is found to be true, then a problem already with us—and likely to become of increasing concern—may be that of achieving reasonable *stability* and conservation of those things that seem good, rather than just the problem of searching for promising innovative programs. In some areas of our lives it would appear that a most welcome change would be stability—for a change!

SUMMARIES OF SELECTED LITERATURE

Arrangement, Headings, and Indexes

The summaries are arranged alphabetically by author, and are numbered serially, the number appearing above the name of the author.

To assist the reader in locating desired material, *headings at top right of each summary* indicate the following:

1. **First entry, in capital letters:** the principal topic covered by the summary
2. **Subsequent entries, above the line:** the secondary topics covered in the summary
3. **Below the line, in capitals:** the type of study summarized

To further assist the reader, three outline indexes have been prepared, as follows:

1. An index of summaries grouped according to the *change aspects* discussed (change resistance, linkage process, etc.), pp. 417 to 418.
2. An index of summaries grouped according to the *type or mode* of the summarized studies (case study, review of literature, analysis, etc.), p. 418.
3. An index of summaries grouped according to the *area of application* to which the articles refer (education, mental health, social work, etc.), p. 418.

The numbers in the Indexes refer to the serial number (*not page number*) of each summary.

1

ORGANIZATIONAL FACTORS

Innovation: education
Resistance to change

ANALYSIS

Abbott, Max C. Hierarchical impediments to innovation in educational organizations. In M. C. Abbott and J. T. Lowell (Eds.), *Change perspectives in educational administration.* Auburn, Alabama: Auburn University, 1965.

Purpose

The article seeks to indicate how the hierarchial bureaucratic structure in educational organizations tends to impede decision making regarding the need for new programs and when they should be instituted, and inhibits program development.

Method

The author uses Weber's bureaucratic paradigm in describing typical school organization. Further interpretations are based on the author's observation and judgment.

Findings and Conclusions

1. The authority in a bureaucratic structure is often based on charismatic characteristics. Emphasis is placed on the "rights" of administrators and the "obligations" of teachers. The structure tends to undermine the professional development of the teaching role.

2. In calling for a new conceptualization of the structure of the educational organization the author argues that it is necessary first to modify the ideology which permeates the institution. In particular, he challenges that part of the ideology that supports and encourages the appropriation of hierarchical prerogatives to enhance the personal status of those in administrative positions.

2

KNOWLEDGE UTILIZATION
Innovation characteristics
Research-practitioner gap
Information needs

EMPIRICAL STUDY

Abelson, Harold H. *Teachers' responsiveness to selected psycho-educational ideas.* (Report No. 70-1) New York: Division of Teacher Education, The City University of New York, 1970.

Purpose

Concerned with the wide discrepancy between available psycho-educational ideas on the one hand and teaching practice on the other, the study surveys the way a small sample of young teachers judge selected ideas with respect to their importance for teaching, their current application, and their comprehensibility. These perceptions are related to certain characteristics of the stated ideas in order to suggest hypotheses as to why some of the ideas are found more acceptable and applicable than others. As a pilot investigation, the study is also concerned with the refinement of instruments and techiques, and with the presentation of a conceptual model of the process whereby ideas may be transformed into practice.

Method

Based on reference to various psychological sources over a long period of years, the author prepared a varied list of prescriptive statements embodying psycho-educational principles. An initial group of 20 and a replication group of 30 teachers rated the 120 items on a three-point scale with respect to: importance for successful teaching; application in current practice; and comprehensibility. Mean item ratings according to each of the three criteria were determined, and correlations were computed between them for paired criteria.

Each item was independently examined by the author and categorized under a number of characteristics, including the following:

1. Sentence complexity (as possibly being a spurious influence).
2. Cognitive versus actional stress.
3. Technicality.
4. Psychological school of thought implied.
5. Aspect of the teaching-learning process to which it refers.

The mean of the mean item ratings was calculated for each subgroup of items under each characteristic, and F values determined by a computerized analysis-of-variance program. The interrelationships among the item characteristics were also determined in an effort to sort out possible indirect sources of influence on the ratings assigned the items by the teachers.

Mean item ratings for each of the criteria were obtained as well for various subgroups of the respondents.

A speculative analysis was made of the elements that may go into the process of transforming ideas into practice.

Findings and Conclusions

Results of the statistical analyses are presented first, followed by the author's suggestions for further research, and concluding with his analysis of the process whereby ideas are transformed into practice.

1. The mean rating of the *importance* of the ideas for teaching was markedly higher than the mean rating assigned the *application* of the ideas to teaching. This was true for every subgroup of teachers, whether subdivided according to grade taught, amount of teaching experience, socioeconomic level of pupils taught, or number of psychology courses taken.

2. The correlations of the mean item ratings for paired criteria were uniformly high: .865 between Importance and Application; 879 between Importance and Comprehensibility; and .844 between Application and Comprehensibility. When the maximum influence of halo effect is taken into account (by determining comparable correlations between different groups of respondents) the coefficients drop, on the average, to .708—still appreciably high.

3. The technicality of an item showed, far and away, the highest relationship with the mean item ratings for each criterion, the higher the technicality, the lower the rating of the idea. The sentence complexity of the statement of the idea

showed a relatively slight relationship in the same direction—one, however, that was hardly sufficient to affect the result with respect to the technicality of the idea itself.

4. The aspect of the teaching-learning process referred to showed the second highest relationship with criterial ratings of the ideational statements. Items referring to pupils and to teaching procedures were rated notably higher in all three criteria than principles of curricular selection, organization, or sequencing, on the average.

5. Statements calling for action, as distinguished from cognitive consideration, were assigned somewhat higher ratings, in general, on all three criteria.

6. As regards psychological school of thought, psychodynamic references were rated higher, on the average, on all criteria as compared with ideas related to either cognitive or behavioral psychology.

7. The close interrelationships in the placement of items according to the several item characteristics suggest that high technicality of an item may well be a cause of lower ratings with respect to other item characteristics, such as aspect of the teaching-learning process, or school of psychological thought.

8. Since technicality may be a key to the extent to which an idea is applied in practice, further research is needed to determine the extent to which the problem rests with the intrinsic abstractness, complexity, or subtlety of the idea, the manner of its communication, or the increase in comprehensibility through improved training of potential users of the idea.

9. However, despite its apparent centrality, technicality is but one of a number of factors that may determine the acceptability of application in practice of psycho-educational ideas.

10. An item data bank of criterial ratings by potential users of ideas and information concerning the expert categorization of items in terms of their characteristics may prove useful in planning training programs calculated to narrow the gap between ideas and their application.

11. The problem of transforming ideas into practice may be viewed speculatively as entailing a transactional process analysis involving aspects or elements such as the following:

(a) Description of the ideas themselves:
  (1) The identification and selection of pertinent ideas.
  (2) The statement of the ideas in manageable (usually prescriptive) terms.
  (3) The application to the ideas of criteria of soundness, validity, significance, relevance, realism, and generality.
  (4) The further characterization of ideas in terms of their origin, assumptive basis, sources of support, and relation to other ideas within the framework of a theory, school of thought, or discipline.

(b) Communication and dissemination of ideas:
  (1) Communicability in terms of abstractness, complexity, precision, expansiveness, overtness, and ease of practical illustration.
  (2) Manner of linguistic expression suited to the dissemination of the idea, including writing, style, appropriateness of conventional forms used in research reports, textbooks, syllabi, feature articles, etc.
  (3) The nature of communication in terms of the status and prestige of the transmitter of the idea, group identifications, and accepted teaching and supervisory roles.

(c) Professional education, supervision, and growth as related to the transmission and implementation of the ideas, including:
  (1) The identification of persons who may assume the role of recipients.
  (2) The place of human and nonhuman media of communication, including the potential use of the hardware and software of instructional technology.
  (3) The characteristics of teachers as learners: their capability and readiness for grasping new ideas, their motivation and professional outlook, their beliefs as to the relevancy and importance of the ideas, their style of coping with learning tasks, their ability to translate ideas into behavior, etc.
  (4) The sequencing of ideas in the professional curriculum, including pre-service and in-service, formal and informal, opportunities for instruction and growth.

(d) The feasibility of executing the stated idea under given conditions dependent on factors such as the following:
  (1) Sufficient time to carry out its dictates.
  (2) Amount of money, effort, or human resources necessary to execute the idea.
  (3) The overall logistics of delivering the educational service implicit in the idea.

12. In view of the complexity of the process of transforming ideas into practice, in place of quick, ad hoc solutions to problems applied in a piecemeal manner, it is essential that the (innovative) task be viewed in terms of a meaningful conceptual

model, preferably reflecting the principles of systems theory, and that research on the problem be characterized by programmatic, long-range planning.

3

RESISTANCE TO CHANGE

Innovation: mental hospital
Resistance reduction

CASE STUDY

Agnew, P. C., and Hsu, F. L. K. Introducing change in a mental hospital. *Human Organization,* 1960, 19, 195-198.

Purpose

The authors describe the processes involved in introducing an innovation and overcoming the resistance to the innovation.

Method

This is an observational study in which the authors describe and analyze the changes they saw occurring. The setting for the study was a 34-bed psychiatric ward of a 516-bed general and surgical Veterans Administration hospital. The innovation studied was: patients wearing their own clothing throughout their stay in the hospital.

Findings and Conclusions

1. *Staff acceptance*—with the presentation of the proposed change came immediate resistance. Many and varied reasons why the change could not be carried out successfully were outlined by opposing staff members.

(a) A series of six meetings, held over a 4-month period, developed several proposals for dealing with the problems arising from the adoption of the proposed change.

(b) In these meetings, free and open discussion prevailed among involved staff members, and over the course of the meetings there was a shift from seeing the proposal as totally impossible to reaching workable solutions for the problems involved with adoption of the innovation.

2. *Patient Acceptance*—the staff were not the only individuals involved. The patients also had to accept the change. When the idea was outlined at the patients' weekly forum, the patients also expressed immediate objections; however, their objections to the change stopped a week or so after the change had been instituted.

3. *Analysis of Shift in Acceptance*—in their analysis of the shift from resistance to acceptance, the authors focus on two aspects; (1) the techniques used by the psychiatrists in dealing with the resistance, and (2) the deeper emotional sources of the resistance.

(a) The psychiatrists' techniques involved encouraging the personnel to express their hostile feelings, while presenting in a calm way detailed solutions to the real problems involved in implementing the change.

(b) The deeper emotional sources of resistance are related to the theory of American self-reliance. Americans are likely to resist change imposed on them by authority from above. The authors suggest that the basis of the resistance to the change was the perceived lack of involvement in the decision-making process. Blind acceptance of authority would mean reduction of self-respect, and self-reliance.

The authors argue that through the meetings the involved staff began to internalize the change, feeling they themselves had something to do with its origination. It was no longer seen as threatening to their self-reliance and self-respect. The authors felt that the patients came to accept the change because the idea of increased individuality provided fresh support and new directions for their self-esteem.

4. *Authors' Discussion of Implications*—the authors feel that the implications of their study are particularly important for the administration of large, bureaucratic organizations in which the

profit motive is absent and in which job security does not fluctuate directly with production. Emerging from this study are the following conclusions:

(a) When an innovation is introduced into an organization, resistance is to be expected.
(b) This resistance can be reduced or eliminated if the American culture pattern of equivalence between self-reliance and self-respect is taken into consideration. A series of conferences avoiding any show of authority and emphasizing the independence of all participants seems an effective method.
(c) A balance between maximized feeling of independence and the need for enforcing policy and authority is the most essential part of administrative technique in American society.

4

ORGANIZATIONAL FACTORS

Innovation: welfare agencies
Implementation of programs

EMPIRICAL STUDY

Aiken, M., and Hage, J. *The relationship between organizational factors and the acceptance of new rehabilitation programs in mental retardation.* Washington, D.C.: Social and Rehabilitation Service (formerly Vocational Rehabilitation Administration), report of project RD-1556-G, Jan. 1, 1968.

Purpose

The two major objectives of this research study were to determine on the one hand those organizational characteristics that affect the rate of program innovation in welfare agencies and, on the other hand, those that affect the extent of cooperation among them.

Method

This is an intensive longitudinal study of 16 rehabilitation organizations.

Findings and Conclusions

1. The rate of new program implementation was highly and positively correlated with the following staff characteristics:

(a) The number of occupational specialties.
(b) The amount of extra-organizational professional training.
(c) The amount of participation and decision-making.
(d) The amount of job morale.

2. It was negatively correlated with:

(a) The amount of job codification.
(b) The satisfaction with expressive relationships.

3. Other factors that were considered, such as amount of professional training, amount of hierarchy of authority, amount of rule observation, had little or no association with the program rate change.

4. Several personality variables were considered and were only weakly associated with organizational innovation.

5. The best predictors for future innovation, even after controlling for factors of organizational size, age, etc., are the number of occupational specialties and the extent of extra-organizational professional activity.

6. Those organizations most likely to have many cooperative relationships have the following characteristics:

(a) A high number of different occupational specialties.
(b) A high rate of program innovation.
(c) A high degree of extra-organizational professional activity.
(d) A high degree of participation by staff in decision making.
(e) A high frequency of committee meetings.

7. From a practical point of view, this suggests that government agencies interested in increasing the likelihood of successful demonstration grants should look to organizations with a wide number of organizational specialties and a previous history of successful program change. For those

CONTINUED

1 OF 5

leaders of health and welfare organizations interested in increasing program implementation, an increase in the following characteristics of their organizations is recommended.

(a) Number of occupational specialties.
(b) Amount of extra-organizational professional activity.
(c) Amount of participation in organizational decision making.
(d) The amount of job morale.

8. Closeness of supervision should be decreased as should specification of role requirements of jobs.

9. The rate of program implementation should not be accelerated too rapidly, even given availability of additional funds. Growth without internal strains is best achieved at a constant pace.

10. Frequency of committee meetings and number of informal contacts of lower status staff with higher status staff, especially with departments other than their own, are correlated with program implementation. Also, if the staff perceives an emphasis on new programs, new programs are more likely. On the other hand, characteristics of the boards of directors of private agencies had little or no relationship to organizational innovation. In terms of cooperation, the authors note that joint programs are more likely to occur in research and education areas than in various kinds of service activities and are more likely to occur between complex organizations.

11. The authors' final conclusion is: "Together these findings might suggest it would be better to develop cooperative relationships among organizations by granting funds for the development of new programs and allowing increasing complexity to lead to spontaneous cooperative relationships; or by granting funds to several private agencies simultaneously. At the same time, this is unlikely to achieve the goal of coordination of community efforts. Indeed the problems that emerge from the needs from organizational autonomy are likely to make such a project highly problematic."

12. The third objective of this study was to test predictions on joint programs, but this has not been possible yet because the project has not developed any joint programs with the 16 organizations in the sample.

5

RESISTANCE TO CHANGE
Change in beliefs
Resistance reduction

EXPERIMENTAL STUDY

Anderson, L. R., and McGuire, W. J. Prior reassurance of group consensus as a factor in producing resistance to persuasion. *Sociometry,* 1965, 28, 44-56.

Purpose

This study was designed to test the notion that a highly reassuring defense confers less resistance to a subsequent persuasive attack than does a more threatening defense. The authors suggest than an individual's ignorance of opposing beliefs and/or arguments against his makes him overconfident about his beliefs; hence he is little motivated to absorb a defense even when one is presented to him. *What he needs in order to develop resistance is not a reassuring defense telling him the reasons his belief is true, but a threatening defense that makes him realize the belief's vulnerability.*

Method

A total of 96 students from a general psychology class were selected from 1,500 possible subjects because their free hours coincided with laboratory schedules. They were divided into three groups and each group was exposed to a different type of written message concerning generally, strongly held beliefs* concerning health practices. The three prepersuasion treatments were: (1) a message supportive of currently held beliefs, (2) a message containing arguments that were to be used later in an attempt to change currently held beliefs, and (3) a message that was generally contrary to currently held beliefs but that did not contain the actual arguments to be used in the later change attempt.

Following the initial exposure all subjects were exposed to the same attempt to change their beliefs.

*These were determined from a preexperiment survey of beliefs and issues concerning commonly accepted health practices.

Findings and Conclusions

1. Individuals exposed to messages containing supportive arguments for currently held beliefs are more vulnerable to attempts made to change their beliefs.

2. Individuals become more resistant to persuasion attempts when they are presented with arguments held against their beliefs, even if the arguments are not the ones used in the persuasion attempt.

3. When individuals are presented with arguments that are to be used again in attacking their beliefs, they are most resistant to attempts to persuade them to a position other than the one they hold.

6

INNOVATION: SCIENTIFIC
Organizational climate
Interpersonal relations

ANALYSIS AND SUGGESTIONS

Andrews, F. M., and Farris, G. F. Supervisory practices and innovation in scientific teams. *Personnel Psychology,* 1967, 20, 497-516.

Purpose

The paper explores the relationship between supervisory practice and scientific performance.

Method

Twenty-one teams of non-supervisory scientists were observed.

Findings and Conclusions

1. When performance was measured in terms of innovation, systematic differences between supervisory groups were clearly evident, and these differences were related to supervisory practices. The findings suggest that the supervisor may play an important role in enhancing or depressing innovation.

2. Greatest innovation occurred under supervisors who knew the technical details of their subordinates' work, who could critically evaluate that work, and who could influence work goals. On the other hand, if the supervisor's technical competence has become obsolete or if the work situation is surrounded by obsolete or less favorable conditions, the data suggest that it is better to provide substantial freedom for subordinates. Freedom is seen as a partial substitute for supervision. For freedom to be effective, the supervisor must consult with his subordinates before certain kinds of decisions are made.

3. It was found that innovation tended to be *low* when supervisors were considered effective at human relations or administration. Freeing supervisors from responsibilities in the human relations and administrative areas may enhance innovation, according to the data obtained in this study.

7

RESEARCH UTILIZATION: MILITARY
Change agent

ANALYTICAL MODEL

Archibald, Kathleen. *The utilization of social research and policy analysis.* (Doctoral dissertation, Washington University) Ann Arbor, Mich.: University Microfilms, 1968, No. 68-10, 771.

Purpose

The author explores the diverse approaches to the activity termed social science. She provides a systematic and generalized description of the rationales, structural opportunities, tactics, and

consequences of the activities of applied social scientists. This is used as a basis for answering the question: How can the social sciences be more effectively utilized in the formulation of policy?

Method

The author focuses on the policy area of arms control, disarmament, and defense. Her main point of reference when discussing the applied social scientist is the expert with reformist interest (experts who both seek knowledge and seek to have it used in the service of desired changes).

The data for the analysis come from: (1) a thorough review and analysis of the literature related to policy analysis and applied social science; (2) focused interviews with 34 staff members of the U.S. Disarmament Administration, and more open-ended and intensive interviews with 13 experts; and (3) observation of several meetings between disarmament personnel and social scientists.

Findings and Conclusions

1. The author assumes that many of the problems arising in the applied social sciences can best be understood as problems of the role of the applied social scientist. Three basic orientations of applied social scientists which can be thought of as "ideal types" are identified: the *academic*, the *clinical*, and the *strategic*. The differentiating characteristics of the three orientations are summarized in Figure 1.

FIGURE 1
Summary of Typology of Orientations

Academic orientation	Clinical orientation	Strategic orientation
Applied activities bounded by discipline.	Applied activities bounded by alter.[1]	Applied activities bounded by problem.
Nonspecific diagnosis. Works in *area* defined by policy concerns, but on problems chosen in terms of disciplinary criteria.	Specific diagnosis concerning alter, that is, the user audience itself. Talks about policymakers or policy process.	Specific diagnosis concerning alter's resources and/or environment. Talks about policy, content of policy.
Alter assumed to know own problem, or at least not the expert's worry if alter does not.	Alter assumed not to understand own problem; expert performs interpretive function.	Alter may or may not know own problem, but assumed to often ask the wrong questions about it.
Contributes to alter: Conceptual framework, general principles, and/or empirical information.	Contributes to alter: New way of approaching reality, self-understanding, and/or techniques.	Contributes to alter: Analysis of practical problem as it "should" confront alter, explication of alternatives, and/or specific recommendations.
Disciplinary colleagues remain the primary audience, user audiences secondary.	User audiences at least as important as disciplinary colleagues.	User audiences at least as important as disciplinary colleagues.
Insignia of expertise: precision on disciplinary details.	Insignia of expertise: perhaps careful specification of intentions and values.	Insignia of expertise: precision on the details of alter's data.
Expert feels he or his discipline has *some* responsibility to contribute to the solution of practical problems.	Expert feels it is *his* responsibility, and his discipline's, to contribute as much as possible to the solution of practical problems.	Responsibility defined in terms of being careful and precise when working on practical problems and when interacting with user audiences.
Stated interest in communicating to alter, often through intermediary.	States interest in helping alter. Asymmetrical.[2]	Stated interest in influencing alter. Symmetrical[2]
Alter seen as different. Nonutilization explained by cultural gap, missing middlemen, or fact that expert contribution is only one of many inputs.	Alter seen as often irrational, constrained. Nonutilization explained by resistance and/or nonsupportive environment.	Alter seen as usually rational but not always intelligent. Nonutilization explained by misunderstanding, ignorance, parochial interests, and/or inertia.

[1] Alter is a synonym of client, user, target, or practitioner.

[2] An asymmetrical relationship implies help for the alter; the expert does not expect to be helped in return. A symmetrical relationship with the alter means the expert expects to influence the alter and he expects the alter to influence him, in turn. It implies the probability of mutual influence.

2. The norms, values, and incentives of pure science provide the basis for the social structure of the science system. Applied science is a low-status and marginal member of the science system because many of its norms are different. The applied scientist's orientation to some kind of user audience other than fellow scientists or students is the essential distinguishing characteristic of applied social science.

3. Of the structured sources of potential influence on the applied social scientist, the greatest influence comes from pure science. Another possible source of influence for the applied scientist is a reference group of other applied scientists. Were such a reference group to develop, it could serve the following functions: (a) provide criteria of legitimacy for applied science, (b) provide some criteria for evaluating the quality of applied science, (c) establish ethical behavior codes, and (d) prescribe efficacious behavior vis-a-vis clients.

4. Several different consumer roles of applied social science research are defined:

(a) *Targets* or *target systems* are the entities which are supposed to be changed, or improved, or otherwise affected by the expert's contribution. A target may or may not be in direct contact with the expert.

(b) *Implementers* are all those persons or social units who, as relatively autonomous decision-making units, give practical effect or expression to an expert's knowledge.

(1) Clients or client systems are those social units which utilize the expert's knowledge and are at some point in direct contact with the expert or expert system.

(2) Client targets or client-target systems are those social units implementing the expert's knowledge and being changed by it.

(c) *The public audience* are those role others who are neither implementers nor targets, but rather are transmission channels. The applied social scientist is enacting a publicist role when he communicates with the public audience.

(d) *Future implementers* are those individuals who may eventually produce long-term, nonspecific applied payoffs. Students would be a good example of future implementers. The applied scientist is enacting an educator role in this instance.

5. The possible role relationships between applied scientists and the various consumers audiences are summarized in Figure 2.

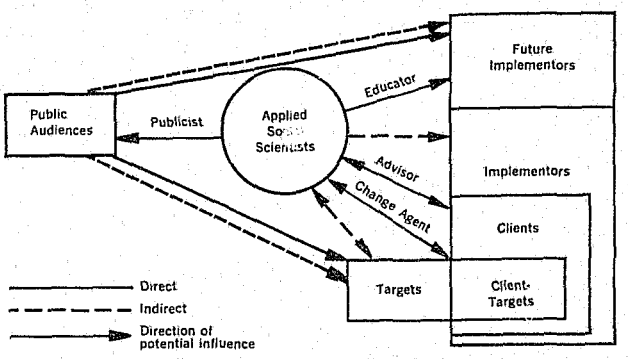


FIGURE 2.
Possible Role Relationships for the Applied Social Scientist in Utilization Activities

6. The author specifies the conditions under which one orientation (academic, clinical, or strategic) is more appropriate than another.

(a) *The role of the change agent*—any of the three orientations may be useful to the change agent, depending on the situation.

(1) A clinical orientation in the change agent role is appropriate when three conditions are met. (a) The client perceives a need for change; (b) when the change agent is viewed as being fully the agent of the client target (is trusted); and (c) when the change agent has sufficient access to, and leverage with, the client target.

The clinical orientation is particularly appropriate in the following situations: (a) when severe conflict between two or more social units exists, (b) when by adopting a clinical orientation the change agent can effect change in one member of a group and thereby affect change throughout the group, (c) when an organization recognizes itself in a state of dire crisis, and (d) when it is a case of limited and specific change.

(2) An academic orientation to the change agent role may be appropriate if the client target does not feel a strong need for help, if it has a favorable view of social science, and if the collection of data causes little inconvenience to the client target. An academic orientation may lead to a better understanding of the client target's problems, but it will not produce change unless both the change agent and the client are able and eager to make it.

(3) A strategic orientation is appropriate when a symptomatic analysis of the alter situation is required; i.e., the diagnosis is made in terms of the alter's resources and

environment. In many instances the most fruitful change agent approach may involve first a strategic orientation to get the ball rolling, then a clinical orientation to apply leverage and secure change.

(b) *The role of advisor*—in the advisory situation, the strategic orientation is most appropriate. The probability of mutual influence inherent in the strategic orientation is most suited to the advisory situation. The academic orientation is not often effective because it is not likely to produce a specific diagnosis of a client's situation, and the clinical orientation is usually inappropriate as the client is treated in a way he does not expect.

(c) *The role of educator*—the academic orientation is most appropriate in the situation where the applied scientist's "role others" are not current implementors. General knowledge is provided in the hope that it will become relevant at some later date.

7. The consequences of the applied social scientist's orientation are discussed in terms of transactions and trade-offs.

(a) *Transactions*—a new view of the essential processes or sequences of activities of the applied scientist is advocated which focuses on applied social research as a sequential transaction. This focus suggests looking at applied science as a relationship or transaction between a scientist and some user audience. For the transaction to be complete there must be some utilization of the knowledge produced. The transaction sequence is affected by the openness or "closedness" of the communication. The more closed a transaction the more limitations on the applied scientist. This applies particularly to limitations imposed by either the client or the scientist on the scientist's ability to communicate the knowledge he has produced to other audiences.

(b) *The critical trade-off: felt autonomy versus felt influence*—autonomy is the salient variable in the production of knowledge, and influence is the most salient variable in the use of knowledge phase. Although the academic orientation is least costly and least risky of all the orientations on the autonomy-influence interchange, both the clinical and strategic orientations offer a greater opportunity to influence.

8

RESEARCHER CHARACTERISTICS

Innovation factors

Interpersonal competence

EMPIRICAL STUDY

Argyris, Chris. *Organization and innovation.* Homewood, Illinois: Richard D. Irwin, 1965.

Purpose

The treatise seeks to show the relation between interpersonal competence and problem-solving effectiveness by applying a new set of categories of human behavior to studies of research and development organizations.

Method

Studies made by questionnaires, interviews, and problem-solving meetings are outlined. An attempt to change the values and behavior of a board of directors is described. The proposed set of categories is subjected to inter-observer reliability study. The use of the system of categories to quantify individual and group interpersonal competence is also studied.

Findings and Conclusions

1. The categories of human behavior considered helpful to scientists are: (a) openness; (b) risk taking; (c) internal commitment; (d) individuality; and (e) concern for truth. Detrimental values include conformity and the suppression of feeling.

2. A model of probable relationship between interpersonal competence, internal organization, environment, and innovation is proposed.

3. Individual and group interpersonal competence is held crucial to creativity and innovation in a research organization.

9

CONSULTANT ROLE
Change agent
Resistance to change

ANALYSIS & SUGGESTIONS

Argyris, Chris. Explorations in consulting-client relationships. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 434-456.

Purpose

The article attempts to analyze the difficulties faced by consultants and to suggest ways to overcome these difficulties.

Method

The analysis and suggested measures are based on the author's experience and judgment. Two case histories are used as illustrations.

Findings and Conclusions

1. The objective of consultants is to promote interpersonal competence. To succeed, the consultant himself must be able to give and receive feedback with a minimum of defensiveness. Consultant behavior is often threatening to the client. If the consultant acts in a defensive manner in order to gain acceptance by adopting the client's values, he risks failure. Thus a major dilemma is created.

2. In addition to a discrepancy in values, another factor which influences the consultant-client relationship is the division of the organization into those who are aware of and wish to bring about effective change and those who are and do not. The invited consultant often has to "straddle" overlapping, and at times antagonistic, subcultures.

3. Organizations should develop a climate in which consultants can express their values. Good relationships tend to be promoted under conditions whereby consultants: (a) may not become part of line management; (b) may have their own professional salary scale; (c) may not be fired for focusing on openness and authenticity; (d) may, however, be dismissed if judged incompetent by their professional colleagues.

10

DIFFUSION: SCIENTIFIC KNOWLEDGE
Practitioner attitudes
Knowledge transmission

ANALYSIS

Barbichon, Guy. The diffusion of scientific and technical knowledge. *Journal of Social Issues*, 1968, 24, 5-12.

Purpose

Barbichon asserts that in order to examine the problems raised by: (a) the acceptance of information likely to modify attitudes and knowledge, and (b) the intensity and specificity of these modifications, we first need to analyze the attitudes toward knowledge and sources of knowledge. Further, we need to examine the cognitive processes by which we integrate scientific and technical knowledge. This article is directed toward an analysis of these factors and how an awareness of them can be utilized in mass media campaigns in developing countries.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. Many studies indicate scientific notions and ideas acquired during formal education prevent the integration of new scientific information into the practice of one's profession.

2. There are three types of knowledge: theoretical, technical, and practical. The cognitive exploration involved in the acquisition of new knowledge depends on both individual and social sys-

tem norms concerning each of the three types of knowledge. Variations in the desirability of scientific exploration among cultures characterize the exploration models of the individuals functioning in that culture.

3. The existence of both interindividual and intercultural differences in cognitive styles makes it necessary to identify the components of these styles. The author suggests three basic elements—

(a) the relative importance of analytical and synthetic processes, of differentiation and integration;

(b) the normative form of access to knowledge (memorization, library, etc.); and

(c) the ideas pertaining to the possession of knowledge (erudition versus encyclopedism versus ability to solve problems).

4. The individual's cognitive style and that of the social system within which he operates both affect his receptivity to new knowledge.

5. Other factors affecting knowledge transmission are the attitudes of the knowledge emitter toward his potential receivers. The knowledge emitter's image of the receiver's needs, cognitive styles, abilities, etc., affects the communication process. Restrictions placed by the emitter may be due to size of audience, content of the message, or cognitive supports of the message, as well as his image of the potential receiver.

11

ORGANIZATIONAL CHANGE
Organizational factors
Organizational climate

ANALYSIS

Barnes, Louis B. Approaches to organizational change. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 79-84.

Purpose

The article purports to review several typological analyses of organizational change that may be helpful to those responsible for coping with changes that might affect an industrial organization.

Method

Several taxonomies are described and related to differences in power distribution in an organization that can affect the way in which changes will be initiated and implemented.

Findings and Conclusions

1. The dynamics underlying change processes in organizations are understood only in a rough, undefined way. The complexity of the phenomenon is due to the fact that a change in technology may result in management changes which may lead to new procedures and policies which may again result in new technologies, and so on.

2. In an effort to choose a limited number of variables to work with, Leavitt (1965) selected four interrelated factors: (a) task; (b) people; (c) technology; and (d) structure. Various writers have tended to stress one or another of these.

3. Shifting from *what* is being changed to *how* the changes are introduced and implemented, Bennis (1966) has constructed a typology consisting of eight approaches that differ according to power distribution, goal setting, and change implementation: (a) planned change; (b) indoctrination change; (c) coercive change; (d) technocratic change; (e) interactional change; (f) socialization change; (g) emulative change; and (h) natural change.

4. Greiner (1965) identified the most common approaches as follows: (a) the decree approach; (b) the replacement approach; (c) the structural approach; (d) the group decision approach; (e) the data discussion approach; (f) the group problem-solving approach; and (g) the T-group approach. This taxonomy, too, reflects variations in power distribution. Not only is an increase in shared control reported, but such control has been found to be more efficacious when successful and less successful large-scale change efforts are studied.

12

INNOVATION ACCEPTANCE/ REJECTION

Attitudes toward change
Communication process

ANALYTICAL MODEL

Barnett, Homer G. The acceptance and rejection of change. In G. K. Zollschan and W. Hirsch (Eds.), *Explorations in social change.* Boston: Houghton Mifflin, 1964, pp. 345-367.

Purpose

To develop a paradigm in which the acceptance-rejection possibilities in any given psychological confrontation of a person with a message may be systematically and exhaustively explored.

Method

The author applies semantic and logical analysis to the possible responses a person may make to an innovative idea, such as "Scientists to experiment on condemned criminals." Expressions of this type are analyzed epistemologically as prototypes of innovations in general, ideologically interpreted. An investigation designed to identify the psychological components of decisions in favor of or opposed to television is cited as an illustration of the possible application of the mode of analysis employed.

Findings and Conclusions

1. Whether a new message (or innovation) will be accepted or rejected will depend on a number of factors:

(a) The structural demands of the language and the resultant relationships inherent in the message.

(b) The message's "psychological contact" (most important) with antecedent experiences of the potential acceptor or rejector.

(c) The relation between the terms of the message and the mental background of the receiver (shared elements, projected meanings, and the like).

(d) The values assigned elements in the message, or their associated interpretations by the recipient.

2. A nine-by-nine matrix giving the 81 "inflections on the rejection-acceptance process" is presented and illustrated to demonstrate how the several psychological-logical combinations may be formed to reflect the possibilities for acceptance or rejection of a message or innovation.

13

DIFFUSION: SOCIAL SCIENCE

Communication media
Researcher attitudes

EMPIRICAL STUDY

Bassett, G., Davison, W. P., and Hopson, A. L. *Social scientists, university news bureaus, and the public: Some factors affecting the communication of social science information.* New York: Graduate School of Journalism, Bureau of Applied Social Research, Columbia University, 1968.

Purpose

This report is primarily concerned with mass media communication. The authors examine factors affecting the flow of social science information to the mass media, and suggest ways to facilitate the flow.

Method

Members of the sociology departments at six universities listed as having superior social science faculties were interviewed.

Findings and Conclusions

1. Almost all of these sociologists felt ambivalent about communicating the results of their work to the public.

(a) On the one hand, there was a widespread feeling among the scholars that the public had a right to know what they were doing and thinking. A sample quote is, "I think most research is significant and the public ought to be informed about it. I think scholars have the obligation to communicate."

(b) On the other hand, many of those interviewed said they simply could not find time for communicating, and finding time is a good index of basic commitment. A sample quote: "If the sociologist is really concerned about scholarship, it's going to be a full-time proposition. His scholarship is bound to suffer if he makes forays into the world."

2. The ambivalence disappeared when it came to communicating with colleagues. Sociologists feel a powerful motivation to communicate with their colleagues. This is indeed a central role obligation. Sometimes the reference group is very small, consisting of only a handful of people working in the same specific field. Some sample quotes: "I communicate by writing articles that only a couple of hundred people read." "We're trying to communicate to people with a more narrow interest." Furthermore, there seems to be a group norm against public communication.

14

ADOPTION PROCESS
Innovation: agriculture
Knowledge utilization

EMPIRICAL STUDY

Beal, G., Rogers, E., and Bohlen, J. Validity of the concept of stages in the adoption process. *Rural Sociology*, 1957, 22, 166-168.

Purpose

To conduct a study of the diffusion and adoption of farm and home practices that was designed to determine whether five conceptualized stages in the adoption process could be validated empirically.

Method

The five stages are described, and the field observations of the interviewers are analyzed in relation to them.

Findings and Conclusions

1. The five stages:

(a) *Awareness*: The individual is exposed to the new practice.

(b) *Information*: The individual is motivated by his curiosity and interest in the new practice to obtain general information about it—the kind of information that will help him relate it to other experiences.

(c) *Application*: The individual is concerned with applying the idea to his present or predicted situation. A decision to try or not to try the new practice is made.

(d) *Trial*: The individual is interested in trying out the idea in his own situation and seeks the specifics of how, what, when and where.

(e) *Adoption*: The thought process at this stage consists of evaluation, satisfaction with the trial, and the decision for continued use.

2. The practice selected for testing the stages was the feeding of antibiotics to swine. Data on information sources for this practice were obtained from 148 farmers residing in the trade area community of a central Iowa town. Questions were asked about information sources at each of the five assumed stages, and each farmer was also asked to recall the dates when he became aware of, tried, and adopted the practice.

3. In general, the data from the study tends to validate the stages. Four types of evidence are available:

(a) *Interviewers' field observations.* Most of the adopters of the practice were aware that they did go through a series of stages as they moved toward the adoption of antibiotics.

(b) *Consistency of stages sequence.* Of the 105 farmers who had adopted the practice, all indicated that they had passed through the stages.

(c) *Different sources for different stages.* In most cases, different sources of information were used for each of the stages. This indicates more differentiation between stages than if the same source had been used for several stages.

(d) *Time span between stages.* There was an average reported time lag of 1.54 years between awareness and adoption. About three-fourths of the farmers gave different years for the awareness and trial stages, and awareness and adoption. Trial and adoption tended to take place in the same year.

15

INNOVATION ADOPTION: HEALTH FIELD

Innovation characteristics
Adopter characteristics

EMPIRICAL STUDY

Becker, Marshall H. Factors affecting diffusion of innovations among health professionals. *American Journal of Public Health,* 1970, 60(2), 294-304.

Purpose

The objective of the study was to identify factors facilitating or inhibiting adoption of new programs by administrators of local health departments.

Method

Data were gathered from 95 local health officers from three States (Michigan, Illinois, and New York) by a combination of self-administered mailed questionnaires and a follow-up telephone interview lasting about an hour. Two kinds of innovations were studied: Those having a high-adoption potential (HAP) and those having a low-adoption potential (LAP). The first category was innovations which required no real departure from traditional patterns of operation (measles immunization in two States, topical application of fluoride in the third); the second category required substantial departure operationally (diabetes screening for all three States).

The focus of the study was on the communications network among health officers.

Findings and Conclusions

1. There was a high positive correlation between early adoption and the health officer's centrality in the communication network. (Centrality is designated as an attribute of the health officer who is frequently contacted by other health officers for information and advice, in contradistinction to the "marginality" of those who are rarely contacted.) This correlation was more pronounced for the HAP innovations than the LAP; the assumption is that when an innovation conflicts with prevailing norms, the marginal person (with less at risk) is more likely to pioneer the adoption. The investigator points out the following implications of this finding:

(a) It supports the two-step flow hypothesis: new ideas are first received and tried out by persons exposed to and influenced by information coming from outside the group; because they have this information, they are seen by their peers as opinion leaders.

(b) Peer influence is important not only in passing along information about new programs but also in legitimating these programs.

(c) In developing strategies for introducing a desirable innovation, it is crucial to be familiar with the communication network for a given group of professionals.

2. There was high correlation between the centrality of a health officer in the communication network and his cosmopoliteness. The cosmopolite

looks outside the community for new ideas and seeks approval of his professional colleagues; the localite is more oriented toward his own department and places greater value on the approval of his own staff and the local community.

3. When health officers were asked to identify their most valued source of information concerning innovations in public health, the early adopters favored professional meetings outside the State, professional journals, and postgraduate courses; those slower to adopt placed greater value on local sources (voluntary health agencies, local medical societies).

4. The following professional and attitudinal characteristics were found to be positively correlated with centrality and cosmopoliteness: rank in medical school graduating class, degree of political liberalness, number of professional degrees earned beyond baccalaureate; in addition, recency of graduation from medical school and possession of specialty training were associated with cosmopoliteness.

5. The following interpretations are advanced by the investigator:

(a) For LAP innovations, normally early adopters hold back until the initial risks have been taken by others.

(b) Centrality may be a result rather than a cause of early adoption; it is because they are early adopters that influential professionals are sought by their peers. Having tried the innovation first, the early adopters will know where the "bugs" are; their less adventuresome colleagues are eager to benefit from their experience.

(c) In his selection of information sources and adoption times, the professional is motivated by a desire to maintain or increase prestige and professional status.

6. The following implications for action are cited:

(a) Opinion leaders among health professionals should be identified and their exposure to innovation should be facilitated (attendance at out-of-State professional meetings, regional conferences, continuing education programs).

(b) The risks of innovation should be reduced by ample support in terms of funds and personnel.

(c) All members of a communications network should be informed of the actions of early adopters as soon as possible.

16

DIFFUSION MODEL

Innovation: medical
Adoption characteristics
Communication process

EMPIRICAL STUDY

Becker, Marshall H. Sociometric location and innovativeness: Reformulation and extension of the diffusion model. *American Sociological Review,* 1970, 35, 267-282.

Purpose

The primary purpose of this report of the study was to evaluate and extend the current theoretical explanation of the diffusion process, particularly as applied to the behavior of professionals, notably to chief administrators of local health departments. A second objective, namely to obtain information that might be employed in enhancing the probability of success of attempts to achieve program acceptance, has been treated in another report (Becker, 1970), which is reviewed in summary #15.

Because of its stress on the first objective, the present report, while employing the same data, procedures, and findings described in the preceding summary, presents a fuller discussion of previous conceptual studies and of the implications of the study findings for the development of a revised model of the diffusion process.

Method

Aside from fuller conceptual treatment, the method employed in the study is described in the preceding summary, to which the reader is re-

ferred. A deeper interpretation of causal relationships among the variables studied is attempted through speculative analysis and the use of partial correlational techniques.

The variables studied include the following:

1. Time of adoption (TOA) of a medical program (presumably attributable to the efforts of the chief health officer).

2. Whether the program had a high adoptive potential (HAP) or a low adoptive potential (LAP) according to the judgments of five experts employing the following eight criteria ranging from positive to negative considerations:

(a) was of obvious practical value in the minds of most professionals in the field;
(b) might be easily communicated to other professionals;
(c) represented a major departure from traditional health activity;
(d) conflicted with important values in the health field;
(e) might be opposed by the county medical society;
(f) might be opposed by interested groups in the community;
(g) if adopted, would threaten the health officer's position or reputation; and
(h) if adopted, would threaten or conflict with established major economic interests.

3. The centrality or the marginality of the health officers in the sociometric or communication network, as determined by questionnaire and telephone interview responses to items relative to:

(a) discussion contacts;
(b) sources of information and advice; and
(c) friendships.

4. Judgments as to the scientific and innovative quality of nine sources of information varying in their general versus local coverage, as follows:

(a) meetings outside the state;
(b) professional journals;
(c) postgraduate courses;
(d) mail/visits from State Health Department;
(e) drug or other industries;
(f) other health officers;
(g) health department staff;
(h) voluntary health agencies; and
(i) local medical society.

5. Characteristics of the chief public health officer, including various factors such as the population of the place where the health officer spent his teens, year of graduation from medical school, standing in medical school graduation class, years in present position, number of out-of-state meetings attended in an average year, most-valued source, and political choice.

Findings and Conclusions

As noted in the preceding summary:

1. A high positive correlation was found between early adoption (TOA) and the health officer's centrality in the communication network, more so for HAP innovations than for LAP innovations.

2. There was a high correlation between the centrality of a health officer in the communication network and his cosmopoliteness as determined by the degree of generality of the sources of information he values (as distinguished from locality of sources).

3. Early adopters found general sources of information more valuable than local sources.

4. Certain professional and attitudinal characteristics were found to be positively correlated with centrality and cosmopoliteness.

The present report goes on to interpret these and other detailed findings more fully, arriving at the following conclusions regarding the probable diffusion model applicable to professional public health leaders:

1. The present research suggests an altered model for the diffusion of innovations among professionals whereby the professional's innovativeness determines his centrality in the communication network (the reverse of the current theory).

2. A desire to maintain and increase prestige and professional status motivates the professional to seek "early" information sources (presumably those of the general or cosmopolite variety).

3. The perceived risk of adoption of an innovation determines the earliness of the source of information selected.

4. Hence, the order of presumed influence may be pictured thus: Desire to obtain, maintain, or increase prestige—with risk of adoption taken into account—influences the most valued source of information, which influences earliness of adoption, which influences centrality in the communication network, which influences prestige status.

5. The apparent exceptional finding that with respect to low adoptive innovations, "marginals" in the communication network, who also value local sources, were also in evidence as early innovators was explained in terms of two concepts:

(a) "system delay" whereby it is suggested that pioneers of LAP innovations may actually be late adopters relative to the time the innovation *could* have been adopted, and that their appearance as earliest adopters relative to others in their group (presumably of LAP adopters) is caused by the influence system's deliberate postponement of adoption of LAP innovations until others have assumed the high risks involved in its trial; and

(b) contrary to the current view in diffusion-research literature, time of adoption is more likely to be a cause than a result of centrality in information networks.

In addition, it is posited that LAP-innovation pioneers innovate to obtain prestige in their communities, while HAP innovation pioneers adopt earliest to gain the admiration of their professional peers.

As a caution, the investigator notes that, while partial correlations and secondary evidence from the study support the revised model, in a nonexperimental design with an absence of information regarding time-order relationships among the variables, it is more appropriate to conclude that the current research found no evidence which contradicted the proposed causal relationships. Hence further, more controlled research is recommended.

17

ORGANIZATIONAL FACTORS
Innovation: business

EMPIRICAL STUDY

Becker, S. W., and Stafford, F. Some determinants of organizational success. *Journal of Business*, 1967, 40, 511-518.

Purpose

The authors of this article set out to investigate the variance in organizational efficiency. The variables considered to be most importantly related to efficiency were: (a) organization size, (b) adoption of innovation, (c) psychological distance in the management team, (d) administrative size, and (e) the state of the organization's surrounding environment.

Method

The study was based on a sample drawn from the 140 savings and loan associations in Cook County, Ill.

Findings and Conclusions

1. Initial growth of the organizations was highly related to the growth of the surrounding community. This was negatively correlated with innovation.

2. After this easy growth period (growth in terms of adding surplus to their funds), there was usually an increase in administrative staff. With this increase in administrative staff came an increase in innovation.

3. In studying the communication within the management group of these organizations, the authors found that organizations with good communication within the managerial group and low-growth rate of the surrounding community are about as efficient as those in rapidly growing communities with poor communication.

4. The group with good communication also had a higher rate of efficiency and a significantly higher rate of innovations.

5. The authors conclude that good group atmosphere generates communication within the managerial group about how to improve business.

18

CHANGE AGENT
Organizational change
Consultant role

CASE STUDY-ANALYSIS

Beckhard, Richard. Helping a group with planned change: A case study. In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes, and R. J. Lewicki (Eds.), *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

To report a one-year consultation effort to assist a small industrial organization to diagnose management communications and to plan systematically a change in relationships among the key executives, the department heads, and their different departments.

Method

Case study/analysis, beginning with a description of the company prior to intervention by the consultant, followed by the planning and implementation stages of the consultation, plus suggestions for facilitating the process.

Findings and Conclusions:

1. The consultant brought three assumptions to the relationship:

(a) There are several developmental phases in a client-consultant relationship which more or less follow in sequence and are repeated.

(b) If persons involved in the client system are to change in their behavior toward each other and for relationships therefore to improve, individuals in the system must learn some new diagnostic skills, some new behaviors, and some new ways of getting information about the effects of their own behavior on other members in the system.

(c) A major function of the consultant is to help the client collect appropriate and correct information about feelings in the situation and then to help create a training or learning situation in which those concerned could, in a supportive climate, look at this information and work jointly on ways of dealing with it.

2. The process of consultation:

Step 1: Initial contact by client system.
Step 2: Defining the problem and establishing the relationship.
Step 3: Planning the first action step.
Step 4: Assessment of facts.
Step 5: Replanning and reestablishing the relationship.

3. Suggestions:

(a) It is necessary to establish a relationship with the several parts of the system before any effective problem solving can be started.

(b) It is important to establish a climate and procedures for feedback both between the helper and the client system and among the parts of the client system if effective change is to take place.

(c) It is necessary to continuously assess the readiness and the capacity of the client system to change.

(d) It is incumbent on the consultant to create a series of conditions in which the client system can learn, because a change situation of this kind is primarily a learning situation.

(e) It is necessary for the consultant to be critical of his own motivations in terms of types of material presented or help offered. He must be sure that the material is designed to meet both perceived and real client needs, not only the consultant's perception of client needs.

(f) It is important that the consultant be aware at all times that in a healthy change relationship the client should always be able to reject the ideas, the help, and the relationship.

(g) It is desirable to create conditions where the consultants can withdraw, at least temporarily, so that the group can become independent and can grow.

(h) It is equally important after an initial change effort that some procedural planning be done for reestablishing the relationship, evaluating the interim action, and evaluating the consultant's role.

19

RESEARCH-PRACTITIONER GAP
Research utilization
Information needs

EMPIRICAL STUDY

Beckhard, Richard. ABS in health care systems: Who needs it? *Journal of Applied Behavioral Science,* 1974, 10, 93-106.

Purpose

The author does not propose to develop a general strategy but rather to speak to five themes: the needs of health system leaders; some unfortunate negative perceptions held by health workers and some held by behavioral scientists; the changing health care situation today; some experiences in collaboration; some thoughts about what behavioral science practitioners can do.

Method

The author, currently a senior lecturer at Sloan School of Management, M.I.T., draws upon a quarter century of experience as a consultant to management and especially on experiences of the past three years in working with health centers and with medical schools preparing doctors for new roles.

Findings and Conclusions

The author has found not only great interest in the application of behavioral science knowledge to health education and health care systems but also much suspicion and doubt regarding the practicality and relevance of this knowledge.

1. Some of the problems identified by various health system leaders:

(a) *Deans of medical schools:* How to manage the complex relationships among basic scientists, clinical department heads, hospital staffs, other units of the university, local legislatures, funding sources, other government agencies.
(b) *Directors and faculties of other health schools:* How to increase collaboration, interface, and appropriate decision making among medical, dental, nursing and other allied health schools.
(c) *Hospital administrators:* New skills demanded by relationships with community health centers.
(d) *Community health center directors:* Managing community volunteers, building a management team, handling role conflicts and intergroup conflicts, managing conflicts of values.
(e) *Hospital interns and residents:* How can we exert more influence on shaping our learning environment?

2. Clusters of perceptions, defenses, traditions and stereotypes that impede collaboration:

(a) *As seen by health practitioners:*
  (1) Behavioral scientists are fuzzy; missionaries rather than hard scientists.
  (2) They introduce sensitivity training and other quasi-psychological procedures.
  (3) They try to carry over experience from the business world which is very different from the health world.
  (4) They seek change for the sake of change.
  (5) They are too theoretical; use too much jargon.

(b) *As seen by behavioral science practitioners:*
  (1) Health systems do not welcome our intervention; they are full of resistance.
  (2) The systems are run by doctors who have little respect for non-medical disciplines.

3. The health situation today:

(a) Increasing numbers of health workers are concerned with *total care* of the *total patient.*
(b) A growing trend toward helping patients manage their own health.
(c) A growing number of health care activists.
(d) A skewed distribution of health workers . . . large segments of the population without adequate medical care.
(e) New categories of health workers are evolving to take over some activities previously reserved for M.D.'s.
(f) In many situations the family rather than the individual, is being seen as the patient unit.
(g) More delivery of primary health care is done by interdisciplinary teams.

(h) Most institutions responsible for medical education are actually considering major curriculum revisions.
(i) Advocacy of more opportunities for women and for minority sections of the population.
(j) New organization patterns are emerging in health care schools; the management of resistance to change is a key issue for health administrators.

The author emphasizes the importance of the helper's *personal investment* in health care systems, as contrasted to the "professional distance" found in much consulting. Clients often seek a doctor-patient relationship between the organization and the helper, and have a high, but masked, need for personal support. If the attitude of the health care helper is one of "Look, there's enough to do. Why work with nonready clients?" he should not be in the field. Perhaps the helper himself has the most difficulty in receiving help.

20

CHANGE STRATEGIES

Organizational change
Change agent

ANALYTICAL MODEL

Beckhard, Richard. Strategies for large system change. *Sloan Management Review*, 1975, 16, 43-55.

Purpose

The article is designed to describe a model of change planning applicable to large and complex organizations, to present specific intervention strategies for accomplishing change, and to pinpoint where in the organization to begin a change effort and how to maintain change once successfully initiated.

Method

The author bases his analysis and suggestions on extensive study and experience as a consultant. Several illustrations are presented.

Findings and Conclusions

1. *Intervention* is defined as affecting ongoing social processes that include:

(a) Interaction between individuals.
(b) Interaction between groups.
(c) Procedures used for transmitting information, making decisions, planning actions, and setting goals.
(d) Strategies and policies guiding the system, the norms, or the unwritten ground rules or values of the system.
(e) Attitudes of people toward work, the organization, authority, and social values.
(f) The distribution of effort within the system.

2. The *suggested model* is designed to enable one to ask the "right" questions, especially with regard to early interventions into the large system. It is presented under four headings:

(a) *Defining the change problem.* This includes the consideration of the organizational change needed or desired and the type of change desired, such as in attitudes, behavior, knowledge, organizational procedure, and work practices. The organizational system and subsystems need to be studied.
(b) *Determining readiness and capability for change.* Readiness refers to attitudinal or motivational energy. Capability signifies physical, financial, or organizational capacity to make the change. An early diagnosis of dissatisfactions is helpful.
(c) *Identifying the consultant's own resources and motivations for change.* Clear understanding with the client regarding the former is important. Concerning motivations, congruence or incongruence needs to be established and clarified.
(d) *Determining the intermediate change strategy and goals.* Intermediate goals provide a target and measuring point en route to larger change objectives.

As part of the diagnostic aspect of the model the subsystems should be examined in terms of readiness to be influenced by the consultant, accessi-

bility of each subsystem, and the linkage of the subsystems to the total system of the organization.

3. The consideration of *intervention strategies in large systems* entails five change components:

(a) *Change in the relationship of the organization to the environment.* Organizations are increasingly being recognized as open systems subject to outside demands. Having identified these, management can turn its energies toward the integration of such items as standards, communication systems, etc., which relate to the multiple interfaces with the environments. There is an increasing demand for the training of change agents with respect to these macro-organization issues.

(b) *Change in managerial strategy.* Change in the *style* of managing the human resources of the organization is called for, whether it be working with top leaders, assessing middle management attitudes, unfreezing old attitudes, developing credibility down the line, or dealing with interface organizations, unions, regulatory agencies, etc. Help needs to be provided in organization diagnosis, job design, goal setting, team building, and planning. Among key aspects of managerial strategy are the handling of conflicts, decision making, rewards, and feedback systems.

(c) *Change in organizational structures.* The structures, or the formal ways that work is organized, need to reflect the actual work to be done rather than the authority system. Temporary structures as well as the more general ones need to be reflected in flow charts for specific jobs to be accomplished.

(d) *Change in the ways work is done.* Special efforts are in order to improve the meaningfulness as well as the efficiency of work. Much latent energy is released by people all over the organization who feel responsible and appreciated for *their* management of *their* work.

(e) *Change in the reward system.* Inappropriate reward systems do much to sabotage effective work as well as organizational health. The reward system needs to be clear, and to include long-range as well as short-range determinants.

4. Concerning early intervention, there are a number of possibilities as to where or how to start, such as with the top team in the system, with a pilot project, with "hurting" systems, with the reward system, with educational interventions, and the like. An organization-wide confrontation may prove helpful in establishing the first steps toward improvement.

5. In order to *maintain change* in a large system it is necessary to have conscious procedures and commitment. Again, a number of interventions are possible. Perhaps the most important single requirement for continued change is a continued feedback and information system. Among the elements of such a system may be included periodic team meetings, organizational sensing meetings, meetings between interdependent units of an organization, renewal conferences, performance reviews, and periodic visits from outside consultants.

6. The author concludes that the demand for assistance in organizational intervention and large system organization change is increasing at a fast rate. Skill available to facilitate these functions will be in increasingly greater demand.

21

ORGANIZATIONAL FACTORS
Barriers to change
Problem solving

ANALYSIS

Benne, Kenneth D. Deliberate changing as the facilitation of growth. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 230-234.

Purpose

The author analyzes the relationship between a change agent and a client system that has solicited help in effecting change and/or solving problems.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. The direction of the change is defined by the concept of growth, which in turn is defined as increased ability on the part of the client to face and solve its problems.

2. A major goal of the agent of change is, therefore, facilitation of the institutionalization of appropriate methodology for adaptation and adjustment by the client system. Norms consonant with growth are:

(a) *Problem solving should be experimental*—growth cannot be achieved in a social system that is stereotyped and inflexible in its modes of response to difficulties. Experimentation requires sensitization to and institutionalization of feedback mechanisms regarding external impacts and internal functioning of parts.

(b) *Problem solving should be collaborative*—all parts of the system ideally cooperate in identifying difficulties in operation, in increasing the internal and external meaning and validity of alternative adaptive and adjustive responses to the situation.

(c) *Problem solving should be task (and reality) oriented rather than oriented to the maintenance of the prestige of some parts of the system over other parts.*

(d) *Problem solving should be educational and/or therapeutic for individual participants in the change.*

(e) *Effective and efficient problem solving requires channels of communications within the system that make available for public decision and choice, in undistorted form, all relevant data, including data concerning feelings and evaluations (negative and positive) from each and every subpart of the system.*

3. Barriers to growth in social systems.

(a) Confusion of the ideological image of the system with the actual behaviors of the system.

(b) Lack of quality control over the feedback processes that provide information on which controlling decisions are based.

(c) Suppression of dominant feelings of some or all parts of the system in processes of decision making.

(d) Narrow time perspective within the decision-making processes—a lack of perception of long-range consequences of action as relevant to immediate decision—tends toward a pattern of living from crisis to crisis in the life of the system.

(e) Inadequate and/or unbalanced role differentiation in system functioning and in processes of decision making.

(f) Inadequate and inaccurate interpretive processes for coding and weighting information received through feedback.

(g) Inaccurate definition of limits and alternatives in decision situations.

(h) Lack of adequate mechanisms for mediation and adjustment of conflicts between parts of system and between the system and other systems in the environment.

22

PLANNED CHANGE
Research-practitioner collaboration
Value criteria

ANALYSIS AND SUGGESTIONS

Benne, Kenneth D. Democratic ethics and human engineering. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 141-152.

Purpose

Operating under the assumption that change agents should incorporate democratic norms or principles into their strategies and plans for introducing change, Benne offers the following principles or methodological norms as guides to planned change efforts.

Method

The author has based his analysis on his own knowledge, experiences, and observations.

Findings and Conclusions

1. The engineering of change and the meeting of pressures on a group or organization toward change must be collaborative. Two kinds of collaboration are suggested: (a) collaboration across lines on divergent action interests in a given situation requiring change; (b) collaboration across lines of "theory" and "practice," between researchers and practitioners.

2. The engineering of change must be educational for the participants. Essentially, the change agent should be training the individuals or organizations involved to be their own change agents, to be able to solve subsequent problems requiring change.

3. The engineering of change must be experimental. Planned arrangements must be seen by those who make them as arrangements to be tested in use and to be modified in terms of the situation.

4. The engineering of change must be task oriented; that is, controlled by the requirements of the problem confronted and its effective solution, rather than oriented to the maintenance or extension of the prestige or power of those who originate contributions.

5. The engineering of change must be anti-individualistic, yet provide for the establishment of appropriate areas of privacy and for the development of persons as creative units of influence in our society.

23

CHANGE STRATEGIES
Planned change
Organizational factors

ANALYTICAL MODEL

Benne, K. D., and Birnbaum, M. Change does not have to be haphazard. *School Review*, 1960, 68, 283-297.

Purpose

The author applies Lewin's model of social change to organizational settings in which structural change and implementation or utilization of new policies might be required (e.g., production levels in industry, discrimination in the community, supervisor-teacher-pupil relations in the school, etc.)

Method

Lewin's model of behavior in institutional settings conceptualizes behavior as a dynamic balance

of forces working in opposite directions. These forces are characterized as either "driving forces" (e.g., the desire for individual workers to attract favorable attention for personal advancement) or "restraining forces" (e.g., poor worker-supervisor relations). Forces are postulated as remaining in a state of "quasi-stationary equilibrium" as long as the status quo is maintained. According to the model, change takes place when an imbalance occurs between the sum of the restraining forces and the sum of the driving forces. Such imbalances unfreeze the pattern; changes are then sought or initiated so as to restore the system to a state of equilibrium.

Findings and Conclusions

1. Three strategies for achieving change are suggested: increase the driving forces; decrease the restraining forces; combine these techniques.

2. From the model, the authors extrapolate a number of principles for effecting institutional change:

(a) To change a subsystem or a part of it, relevant aspects of the environment also must be changed (e.g., if you desire to change the roles of teachers, principals must adjust their roles so as to complement and reinforce the change).

(b) To change behavior on any one level of a hierarchical organization, it is necessary to achieve complementary and reinforcing changes in the organizational levels above and below the level being changed (e.g., attempts to change the role of the sergeancy after World War II led to unavoidable alterations in the role of lieutenant, private and corporal).

(c) The place to begin change is at those points in the system where *some* strain exists. Stress may give rise to dissatisfaction with the status quo and thus become a motivating factor.

(d) In diagnosing the possibility for change in a given institution, it is always necessary to assess the degree of stress and strain at points where change is sought. Initiating change at the point of greatest stress should ordinarily be avoided (e.g., the implementation of innovations at a point of maximum stress tends to lower morale and create more imbalance.)

(e) If changes in a hierarchical structure are desired, change should ordinarily start with the policy-making body, since sanction by the ruling body lends legitimacy to any institutional change (e.g., community resistance to efforts to desegregate schools in localities where boards of education had not publicly agreed to the change).

(f) Both the formal and informal organizations of an institution must be considered in planning any process of change. Cliques and informal groupings can exert strong restraining influences on changes initiated by formal authority; thus their power must be harnessed by including these groups in planning and initiating changes.

(g) The effectiveness of planned change is related to the degree to which members at all levels of an institutional hierarchy take part in the fact finding and diagnosing of needed changes, as well as the formulation and testing of program goals.

24

ORGANIZATIONAL CHANGE
Change models
Change strategies

ANALYTICAL MODEL

Bennis, Warren G. A new role for the behavioral sciences: Effecting organizational change. *Administrative Science Quarterly*, 1963, 8, 125-166.

Purpose

The paper discusses the function of the behavioral scientist in effecting organizational change. It seeks to make explicit various approaches, biases in viewpoint, models, dilemmas, and issues relatiave to the change process.

Method

Analysis and discussion of change models.

Findings and Conclusions

1. Traditional approaches to change are listed as follows:

(a) Exposition and propagation
(b) Power elite corps
(c) Psychoanalytic insight
(d) Staff
(e) Scholarly consultations
(f) Circulation of ideas to the elite

2. Each of these modes differ in many ways, but they are similar in wanting to use knowledge to gain some socially desirable end. However, four significant biases can be identified:

(a) Rationalistic bias: no program. Knowledge about something does not necessarily lead to intelligent action.
(b) Technocratic bias: no collaboration. Presentation of a program does not mean that the client can carry it out.
(c) Elite bias: no organizational strategy. This accepts the notion of a unified and willfully coordinated power elite and ignores organizational forces and norms.
(d) Insight bias: no manipulability. Insight does not necessarily lead to more effective functioning.

3. Bennis describes planned change as a deliberate and collaborative process involving a change agent and client systems. The objective is to solve a problem and/or to achieve an improved state of functioning in the client system by utilizing and applying valid knowledge.

4. Concerning the uses of knowledge in effecting organizational change, three approaches are described:

(a) Equilibrium model. This model is associated with Cyril Safer and the Tavistock Institute. The mechanism for change is tension release through anxiety reduction.
(b) Organic model. This model is associated with R. R. Blake and H. Shepherd. The mechanism for change is power redistribution and conflict resolution.
(c) Developmental model. This model is associated with Chris Argyris. The mechanism for change is transformation of values.

All three approaches have a deep concern with the application of social knowledge to create more viable social systems; a commitment to action, as well as a research role for the social scientist; and a belief that improved interpersonal and group relationships ultimately will lead to better organizational performance.

5. Some of the dilemmas these approaches face are noted:

(a) How do these ideas link with other theories of social change in the more traditional sociological and psychological disciplines?
(b) What can be done about "fade-out" of training and transfer of laboratory training to other settings?
(c) Will the new organizational values lead to improved performance? Are there some needs which can best be met through the bureaucratic mechanism?
(d) What are the methods of studying the change process?
(e) What is the unit of change?
(f) How are change agents to be trained?

In addition, all three models tend to de-emphasize the cognitive processes of problem solving and fail to include some criterion of objective performance.

6. Issues relative to dilemmas in the new action role for the behavioral sciences are presented as follows:

(a) Detachment versus Involvement. How is the conflict between commitment to the client system and preserving ethical and effective neutrality to be managed?
(b) Help versus Study. The change agent may acquire knowledge which is private and yet possibly helpful. How is this conflict to be resolved?
(c) Boldness versus Caution. What is the best approach?
(d) Relationships versus Knowledge. How can a collaborative relationship between these considerations be developed?

25

ORGANIZATIONAL CHANGE
Planned change
Change agent

ANALYSIS

Bennis, Warren G. Theory and method in applying behavioral science to planned organizational change. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 62-78.

Purpose

The paper focuses on the emerging role of the behavioral scientist in his attempt to apply sociological and psychological knowledge toward the improvement of human organizations.

Method

The author fortifies his own theoretical analysis with numerous references to the literature of organizational change.

Findings and Conclusions

1. The manipulative standpoint as distinguished from the contemplative standpoint is evidenced in the emerging action role of the behavioral scientist. Notwithstanding, the "newer" theories tend to explain the dynamic interactions of a system without providing clues to the identification of strategic leverages for alteration.

2. A theory of changing must: (a) include manipulative variables; (b) not violate the client system values; (c) not be prohibitive in cost; (d) provide a reliable basis for diagnosing the strength and weakness of conditions facing the client system; (e) develop time estimates of phases and termination of change agent intervention; (f) be communicable to the client system; and (g) permit assessment of the appropriateness of the theory for different client systems.

3. The notion of planned change can be viewed as the linkage of knowledge and action which involves a change agent, a client system, and the collaborative attempt to apply knowledge to the client's problems. Planned change differs from operational research perhaps most crucially with regard to the identification of strategic variables. The former is concerned with: (a) the identification of mission and values; (b) collaboration and conflict; (c) control and leadership; (d) resistance and adaptation to change; (e) utilization of human resources; (f) communication; and (g) management development; whereas operations research tends toward economic and engineering variables that are more quantitative, measurable, and linked to profit and efficiency.

4. Eight types of change programs, all of which are subject to intrinsic biases and flaws, may be identified: (a) exposition and propagation; (b) elite corps programs; (c) human relations programs; (d) staff programs; (e) scholarly consultation; (f) circulation of ideas; (g) developmental research; and (h) action research.

5. The goals of change agents are multiple, ranging from improving the interpersonal competence of managers and increasing understanding among working groups to training in problem solving. Change agents are concerned with training, consulting, and applying research. They employ a variety of strategies.

6. The aspect of the planned change process we know least about is implementation. Nonetheless, a number of necessary elements in implementation may be set down as follows:

(a) The client system should have as much understanding of the change and its consequences as possible.
(b) The change effort should be as self-motivated and voluntary as possible.
(c) The change program must include emotional and value elements, as well as cognitive ones.
(d) The change agent can be crucial in reducing resistance to change.

26

CHANGE PROCESS: SOCIAL
Organizational factors
Innovations: bureaucracy

ANALYSIS

Bennis, W. G. Changing organizations. In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes, and R. J. Lewicki (Eds.), *Social innovation: A behavioral science approach*. New York: The Free Press, 1971.

Purpose

The author develops and substantiates the premise that the bureaucratic form of organization is "out of joint" with contemporary realities, and that drastic changes in the conduct of corporation and managerial practices are necessary. He also speculates about the changes in organizational structure that might evolve.

Method

The author's analysis is based on his own knowledge, experience and observations.

Findings and Conclusions

The author outlines two main reasons for the proposed changes in organizational structure: (1) population and knowledge explosions, and (2) "organizational revitalization," a complex social phenomenon conceptualized by the author as a deliberate and self-conscious examination of organizational behavior and a collaborative relationship between managers and scientists to improve performance.

Organizational problems faced by any bureaucratic system include:

1. How to integrate individual needs and management goals.
2. How to distribute power and sources of power and authority in a bureaucratic system.
3. How to manage and resolve conflicts.

A number of situational characteristics exist which present difficulties for bureaucratic systems:

1. Emergence of human sciences with an increased understanding of and emphasis on man's complexity (i.e., his need to be dealt with in a humane rather than machine-like fashion).
2. Separation of management from ownership.
3. The rise of trade unions.
4. A rapid increase in the educational attainments of the population at large.
5. Specialization and professionalization, with an accompanying need for interdependence among disciplines.
6. Rapid changes in technologies, manpower, norms and values of society, goals of enterprise and society at large.

On the basis of these and other 20th-century situational contingencies, the author formulates the following predictions:

1. The tasks of the business firm will become more technical, complicated and unprogrammed.
2. Because of (1) above there will be more conflict and contradiction among diverse criteria of organizational effectiveness (e.g., the present conflict between the research and instructional roles of the university will increase).
3. The bureaucratic structure of organizations will be replaced by adaptive, problem-solving, temporary structures of diverse specialists linked together by coordinating and task-evaluating specialties.
4. The new structure should enhance motivation and thereby effectiveness since it will enhance satisfactions intrinsic to the task.

27

PLANNED CHANGE
Change process: social
Change agent
Persuasion process

ANALYTICAL MODEL

Bennis, W. G., Benne, K. D., and Chin, R. (Eds.) *The planning of change* (2nd ed). New York: Holt, Rinehart & Winston, 1969.

Purpose

Change is with us. The major purpose of this book is to provide a basis for the application of systematic and appropriate knowledge to human affairs for the purpose of creating intelligent action and change.

The authors define planned change as "a conscious, deliberate, and collaborative effort to improve the operations of a system, whether it be self-system, social system, or cultural system, through the utilization of scientific knowledge" (p. 3).

The emphasis is on how change is created, implemented, evaluated, maintained, and resisted. The authors emphasize the role of the change agent, examining the relationships between the change agent and client, and among change agents.

Method

The ideas in this book are based on the broad experience and observations of the authors.

Findings and Conclusions

1. The Roots of Planned Change.

(a) The authors trace the development of 20th-century man's ability to control, direct, and manage social change. They describe the need for a valid framework for an applied social science and suggest the following: (1) an interdisciplinary applied social science that takes into consideration the behavior of persons operating within their specific institutional environments; (2) an applied social science capable of accounting for the interrelated levels within the social change context; (3) an applied social science that includes variables the practitioner can understand, manipulate, and evaluate; (4) an applied social science that in specific situations can select from among variables those most appropriate to a specific local situation in terms of its values, ethics, and moralities; (5) an applied social science that is pluralistically "real," accepting the premise that groups and organizations are units that are amenable to empirical and analytical treatment; (6) an applied social science that can take into account "external" social processes of change as well as the interpersonal aspects of the collaborative process; (7) an applied social science that includes propositions susceptible to empirical test, focusing on the dynamics of change.

(b) The authors concentrate on the change agent, contending that a client system must build into its own structures a vigorous change agent function in order to develop the capability to adapt to a continually changing environment.

2. Conceptual Tools for the Change Agent: Social Systems and Change Models.

(a) The readings in this section deal with social systems in stability, change and conflict; the small group and change; characteristics of other client systems; and some strategic leverage points that can be utilized in planning change campaigns. The system is used as a focal point because it emphasizes the functional interrelations between the parts of a client, be the client a person, group, organization, or culture. The small group is an important element in the larger social system and an important influence on the individual. Many studies point to the small group as a major tool for all change agents in achieving changes. Because the concept of self is relatively accessible for scrutiny, analysis, and change by change agents, the authors explore the studies dealing with the self and change. A role is the behavioral patterns expected and enacted in a social interaction, and combines aspects of personality with the

social settings in which people operate and with the organized structures and larger systems of which particular social settings are a part. Role is the major bridge for interrelating ideas from the psychology of individuals and the sociology of groups.

(b) The community and organizations are focused on in the latter part of this section.

(c) The final portion of this part of the text is devoted to an analysis of some of the variables that have proven to be important factors in decisions change agents make concerning the avenues they should take in promoting change. These variables can be categorized under the headings of *motivation, communication*, and *power*.

3. Dynamics of the Influence Process.

This part of the book attempts to capture some of the theoretical and practical significance of the influence process for the study of human change. *If change is to occur influence must occur.* The authors concern themselves with the following issues: (a) institutional arrangements for influence, (b) purposes of influence, (c) kinds of influence processes, (d) dialectics in the influence process, and (e) response to influence.

(a) The kind of institution determines to a large extent the dynamics of influence. The degree to which the institution serves as a barrier to social intercourse with the outside dictates the amount of control the institution wields on the individual members. The degree to which the organization or institution provides cognitive clarity as to the nature of the relationships between the individual and the organization is still another important factor in the influence process.

The three institutional variables that appear to be important are: (1) the degree to which the institution is total, (2) the degree to which the relationship between the individual and the institution is voluntary, and (3) the degree to which the institution's main goal orientation is indoctrination or change.

(b) The authors propose the following as a paradigm for examining influence goals: cognitive, affective or emotional, and motoric dimensions on one axis, and methodological and content categories on the other.

(c) There appears to be not one kind of influence, but several; and of these, some are strongly internalized, others not; some unconscious, some not; some are adopted out of fear and intimidation, others out of reality considerations.

(d) The dialectics considered by the authors are: (1) the dialectic between cognition and experience, (2) the dialectic between necessity and desirability, (3) the dialectic between self and other, (4) the dialectic between knowledge and action. The last of these is probably the most relevant for those interested in achieving utilization of research.

(e) The response to influence seems to take two basic forms: conformity and revolution.

4. Programs and Technologies of Planned Change.

(a) Some specific planned change programs are explored in this part of the text. Three pivotal functions in planned change are explored: training, consulting, and applied research. These functions were chosen because consulting leads to adequate diagnosis; training to internalization of prerequisite skills; and research to evaluation of the two prior steps.

(b) The main question related to training is: How can a training program provide an opportunity in which individuals can learn new behaviors, new perceptions, new orientations—which may require some isolation from the everyday pressures of the organization—and still have the learnings feed back into the organization?

(c) How does the consultant (a stranger) help bring about change in an existing social system? Focusing on the problem of the client, rather than on the client, the consultant plays an advisory role and does not have to implement a plan to solve the problem. The role of the consultant-trainer appears to reduce the gap between diagnosis and action and provides what appears to be a reasonable answer to the questions raised dealing with the transferability to the action setting.

(d) The relationship between the researcher and the organization under study is considered. Applied research is analyzed in terms of a complex of relationships: between the applied science and scientific method; between the applied scientist and his subjects; between the organization and subjects turned clients.

28

ORGANIZATIONAL FACTORS
Change agent
Training laboratory

ANALYTICAL MODEL

Bennis, W. G., and Schein, E. H. Principles and strategies in the use of laboratory training for improving social systems. In W. G. Bennis, K. D. Bennis, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 335-357.

Purpose

The authors undertake to explore the ways in which the training laboratory can serve as an instrument to aid organizations in meeting the tasks of adaptation and collaboration.

Method

The method is primarily analytical, with the authors drawing on their own extensive experience in the field. Three case studies are cited, but they elaborate the principles developed here, rather than serving as the basis for those principles.

Findings and Conclusions

1. The suitability of a training laboratory for any specific organization can be assessed in terms of the state of the target system at that specific time. This involves such considerations as:

(a) Are the learning goals of laboratory training appropriate? Are the outcomes relevant to the effectiveness of the target system? Is laboratory training timely, economical, congruent with the anticipated trends of the target system?

(b) The values of the target system should not clash too violently with the values of laboratory training (authenticity, choice, collaboration, expression of feelings). Some of the dimensions of the "cultural state" of the target system:

(1) Interpersonal relationship should be considered legitimate by management—neither irrelevant nor frivolous nor an invasion of privacy.

(2) If the control and authority system presently employed by the target system is too rigid and authoritarian, this may conflict seriously with the values of laboratory training.

(3) It is best not to introduce laboratory training in a target system which is in the throes of intense conflict.

(4) If laboratory training is applied only to a subsystem, repercussions elsewhere in the target system can be anticipated. The internal boundary system of the target system must be kept in mind.

(5) If laboratory training is to be introduced, the target system must have a healthy, realistic understanding of the role of the change agent.

(c) Key people in the target system must be informed about and involved in the training laboratory.

(d) Members of the target system must be adequately prepared for and oriented to laboratory training. This preparation should be experiential rather than verbal (pilot projects, trial runs, etc.).

(e) Participation in laboratory training must be voluntary.

2. Several models for the change agent are explored:

(a) He can be external or internal. The external change agent has the advantage of detachment, perspective, and energy not drained off by other duties. The internal change agent has the advantage of intimate knowledge of the target system, and of not generating mistrust and suspicion.

(b) The source of the change agent's power is a combination of expert power (skill, competence) and line power (status in the organization which legitimizes his influence).

(c) The authors state that the most common model is that of the external change agent employing expert power: the consultant model.

3. The role of the change agent includes the following elements:

(a) He is a professional, guided by certain ethical

principles, and acting in the client's interests rather than his own.

(b) He is marginal, without formal membership in the target system and often without the immediate supporting presence of colleagues.

(c) His role is ambiguous, not widely understood, often lacking in legitimacy and credibility, sometimes viewed with suspicion and hostility.

(d) His role is insecure. He may be considered expendable; there are few guidelines for his actions; he is almost certain to encounter resistances.

(e) His role is potentially risky—both to the target system and to his professional status.

4. The competence of the change agent should encompass: conceptual diagnostic knowledge cutting across all behavioral sciences; knowledge of theories and methods of organizational change; knowledge of sources of help; orientation to the ethical and evaluative functions of the change agent's role. He should possess operational and relational skills, must recognize his own motivations, act in a manner consistent with the values he is attempting to impose on the target system. "The change agent must not impose democratic or humanistic values in an authoritarian or inhuman manner" (p. 346).

5. Strategies for the implementation of laboratory training include the following considerations:

(a) In the course of the training experience, the identity of the client shifts and oscillates—from organization to specific group to particular individual within the group.

(b) The point of entry is often top management, with the assumption that change will percolate down; in some organizational situations, however, it is less risky to enter at lower levels.

(c) The interdependencies of the subsystems within the target systems must be carefully worked out.

(d) The change agent should attempt to involve the target system in planning and goal setting for the change program.

29

CONSULTATION: MENTAL HEALTH

Individual reeducation
Consultation measures

ANALYSIS

Berlin, Irving N. Learning mental health consultation history and problems. *Mental Hygiene*, 1964, 48, 257-266.

Purpose

To set forth the considerations affecting the learning and teaching of mental health consultation.

Method

The author incorporates his own thinking on the subject with the ideas expressed in references by other writers.

Findings and Conclusions

1. Mental health consultation, as differentiated from consultation to agencies of a technical advisory nature, was first described in 1947. Since then, many others have enunciated the principles and practice of this process. The teaching and learning of mental health consultation is rapidly becoming one of the most vital areas in community and preventive psychiatry.

2. Such consultation is an indirect method of focusing on the work problems of an agency worker to help him with the internalized conflicts related to the problems. It can be described as a process in which a consultant tries to help a consultee from another profession with the latter's work problem.

3. In recent years both the informal and the formal teaching of this method has occurred.

4. Mental health professionals need to unlearn their generic methods in some respects, and to substitute an indirect method in which satisfactions are often delayed. Trainers may find that intro-

duciary contacts with the consultee are frequently replete with disappointments. Consultant anxiety is an expected part of the process because of the many, varied implicit and explicit demands of the consultee.

5. Administrators may prove particularly difficult to engage in consultation because they may see it as a threat to their adequacy.

6. Additional problems in consultation relate to the intrusion of expected direct service to the agency involved, uncertainties as to the appropriate levels of communication manifested in requests for help, and various obstacles generally pertaining to teaching.

30

RESISTANCE TO CHANGE: MENTAL HEALTH

Resistance reduction

ANALYSIS AND SUGGESTIONS

Berlin, Irving N. Resistance to change in mental health professionals. *American Journal of Orthopsychiatry*, 1968, 38, 509-519.

Purpose

In this article the author discusses what he feels to be some of the major factors inhibiting change in mental health practice. He suggests some possible ways in which this resistance can be overcome.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. The following factors are cited as producing resistance:

(a) *Personal satisfactions* – the author feels that one's personal satisfactions in the mental health professions depend upon "having learned a certain body of theory and practice and *becoming* fairly proficient in its use." Experience with learned techniques leads to proficiency and comfort which would be endangered if individuals were to initiate new theories and techniques. According to Berlin personal satisfaction is likely to decrease during the initiation of innovation practices.

(b) *Money and status* – the money and status accorded a mental health professional who uses tried and true techniques becomes endangered if he champions new techniques. Most clients prefer time-tested techniques to innovative practices not yet "proven" totally successful.

(c) *Uncertainty* – The theories and assumptions behind most innovations in the mental health field are usually neither explicit nor carefully tested in practice. These unknown factors produce an uncertainty about use. One most mental health professionals would rather forego than face. "Uncertainty is anxiety provoking, questioning of our basic premises is threatening, and evaluating our work so we can continue to learn and grow is frightening."

Somewhat related to the uncertainty syndrome is the fear of discovery that one is not so competent or effective as one had hoped. This also prevents experimentation with innovation.

(d) *Tendency to guard old statuses* – Berlin suggests that changes can often result in an alteration of status, which in turn is threatening. The use of subprofessionals is an example of a status-altering change that has proved threatening to many mental health professionals.

2. Three suggestions are offered for overcoming resistance to innovation in mental health professionals. They are:

(a) *Community involvement* – through participation in community action projects the mental health professional may be forced to reexamine his methods and techniques for dealing with mental health problems. Com-

munity involvement gets him out of the office and into the "real world."

(b) *Pilot programs*—through involvement in pilot projects the mental health professional is given a somewhat "anxiety-free" situation to experiment with and practice new techniques. Pilot programs can be helpful for developing theoretical understanding of new ideas.

(c) *Group discussions*—regular meetings of mental health professionals in which they can discuss relevant new ideas may provide necessary support for actual experimentation.

31

INNOVATION DIFFUSION
Research utilization process
Diffusion model

ANALYTICAL MODEL

Bhola, Harbans S. *A configurational theory of innovation diffusion.* Columbus, Ohio: Bureau of Educational Research, College of Education, Ohio State University, 1965.

Purpose

The theory presented in this paper is designed to explain the process of innovation diffusion and to predict success or failure of innovation diffusion plans and projects.

Method

The author has based his analysis on his own knowledge, experiences, and observations.

Findings and Conclusions

1. The configurational theory of innovation diffusion can be stated as a function (f) symbolized as: $D=f(C_{it}LER)$. Diffusion (d) of innovation is a function (f) of the Configurational (C) relationship between the Initiator (i) from a class of such initiators and the Target (t) from a class of such targets; the extent and nature of Linkage (L) between and within configurations; the environment (E) in which the configurations are located; and the resources (R) of both the initiator and target configurations.

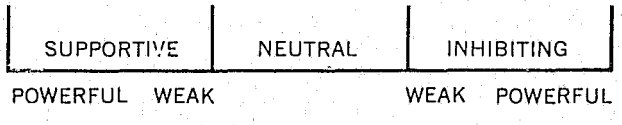
2. Configurations are social units within which individuals play a variety of formal and informal social rules. These roles may be played by individuals in groups, in institutions, or in cultures. An initiation configuration acting on another target configuration together make a configurational relationship, symbolized by C_{it}.

3. Linkage is communication. Two configurations are in linkage when they are in communication with each other.

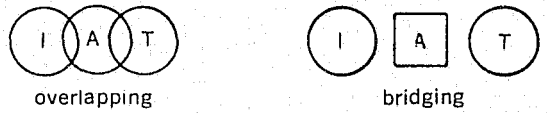
4. Bhola adapts Guba's and Clark's theory-into-action model by adding another phase after implementation called service and support (see Fig. 1). Bhola sees diffusion carried through the implementation phase as functional diffusion. It becomes total diffusion when carried through the support phase.

5. The environment in which diffusion takes place can be supportive, neutral, or inhibiting.

The supportive and inhibiting environments can be either weak or powerful.



6. Bhola suggests that the initiator (I) and target (T) configurations may need an articulating force, an adapter (A) that either overlaps or bridges the gap between the initiator and the target.



7. The resources necessary for innovation diffusion are: material resources, resources of conceptual skills, resources of personnel, and resources of influence.

FIGURE 1
Change in a Social Process Field

	Research	Development	Dissemination	Demonstration	Implementation	Service and Support
Objective	Advance knowledge.	Apply knowledge.	Distribute knowledge.	Build conviction.	Facilitate action.	Consolidation of adoption.
Criteria	Validity of knowledge produced.	Feasibility Performance.	Intelligibility Fidelity. Comprehensiveness. Pervasiveness.	Credibility	Effectiveness Efficiency.	Generalizibility. Acceptibility. Accessibility.
Relation to change.	Provides basis for innovation.	Produces innovation.	Informs about innovation.	Promotes innovation.	Incorporates innovation.	Integrates innovation.

32

CHANGE STRATEGIES
Intergroup relations
Training laboratory

CASE STUDY-ANALYSIS

Blake, R. R., Mouton, J. S., and Sloma, R. L. The union-management intergroup laboratory: Strategy for resolving intergroup conflict. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 176-191.

Purpose

The article seeks to throw light on an approach to the resolution of conflict and hostility between labor and management in a given plant. The approach involved a carefully designed, two-day educational laboratory based on behavioral science concepts.

Method

The strategy for conflict management that was developed combined the application of basic research findings and a technology of face-to-face confrontation, in open conflict, of the images each party held of the other and itself. In the two-day series of conferences the two groups met together at times, and at times separately. The role of the change agent is described in detail. The union-management laboratory included the following phases:

(a) Orientation.
(b) Intragroup development of own image.
(c) Exchange of images across groups.
(d) Clarification of images.
(e) Intragroup diagnosis of present relationship.
(f) Consolidation of key issues and sources of friction.
(g) Planning next steps.

Findings and Conclusions

1. Increasing interdependence among groups in carrying out various functions can aid organizations in the accomplishment of mutual goals, but can also breed hostility and disruptive conflict.

2. Holding a two-day educational laboratory in which differences between representatives of labor and management presented images of themselves and of one another led to a slow movement toward better understanding. Subsequently, the impact of the sessions was found to be greater in treating new issues than in resolving old ones.

3. Correcting a situation of long-standing, chronic hostility requires continuous and diligent follow-up efforts, lasting over as many as a five-year span in some instances.

33

INNOVATION: MENTAL HEALTH
Resistance to change

EMPIRICAL STUDY

Blum, R. H., and Downing, J. J. Staff responses to innovation in a mental health service. *American Journal of Public Health*, 1964, 54, 1230-1240.

Purpose

This paper was developed to shed light on the following questions: What varieties of professional response to innovation must be anticipated and under what conditions is a given response most likely to occur? How can change be introduced so as to minimize resistance? If resistance to change occurs, is the administrator more likely to achieve his goals by increasing coercive pressures or by yielding to some degree in the face of determined staff opposition? Just how should the psychiatric administrator go about introducing change and what can he expect as a result?

Method

The setting for the study was a county (San Mateo County, Calif.) in which three administratively autonomous mental health services were centralized in one division and put under the direction of a newly created administrative section. Three innovations were introduced to achieve the following goals: immediacy of treatment, continuity of care, diversity of treatment, more efficient use of staff time, improved record keeping, and systematic evaluation. Each of the three innovative activities was introduced in a different setting and in a different manner, ranging from high to low degree of central control and coercion.

1. A new treatment team in the adult unit was initiated without support or approval of the chief of service, and outside personnel were brought in to staff it. This new team differed markedly from the parent unit in its work patterns.

2. A new treatment team in the child guidance clinic was completely integrated with the ongoing program; and the chief of service, though he had some initial resistance, was given full responsibility for the new unit.

3. The third innovation was an alcohol unit, a new service with a new staff; no coercion was involved in its installation.

The response of mental health professionals to these innovations was measured by the following instruments: records of complaints and terminations, records of activity and efficiency, a questionnaire to all staff members shortly after plans for the innovations had been announced, a questionnaire one year after the new programs were underway.

Findings and Conclusions

1. Staff terminations were most frequent in the service that experienced the most forcibly imposed change (the special treatment team in the adult clinic).

2. In the administrator's judgment, there were more staff complaints and special administrative problems in this same service unit during the 12 months following the innovation.

3. There was a greater time-lag in the adult clinic than in the other new services between staffing and the delivery of services.

4. Response to the initial questionnaire indicated that the new treatment team in the adult clinic had the most intense emotional reaction to the innovation and were particularly suspicious of the "real" motive of the administrator in making the change.

5. Response of the one-year-later questionnaire indicated that much of the hostility toward the innovation on the part of the adult clinic team had subsided.

6. On the basis of the foregoing findings, the authors conclude: The intensity of the negative reaction of professionals appears related to the extent to which the power and prestige of local service chiefs are threatened, the extent to which control is taken out of their hands, the extent to which existing informal work relations are disrupted, and the extent that coercive pressures are applied to require marked deviations from traditional procedures.

7. Despite its resistance to change, the innovative team in the adult clinic was more successful in achieving the goals of the innovative approach than were the other two units; the fact that they had the aid of outside experts contributed to this.

Conclusion: Goals can be achieved in spite of staff resistance, providing administrative support and sanctions are firm.

8. At the end of a year, the innovative treatment teams in both the adult and children's units elected to dissolve, and personnel of both teams were reabsorbed into their respective parent units. Peer pressure plus lack of tolerance for autonomy were significant factors in their decision to disband.

9. The adult team had a greater impact on its parent unit after reabsorption than did the children's team; it should be remembered that it departed more drastically from traditional procedures. In short, the innovation which produced the *most resistance* and the greatest disruption was the one which best achieved its goals and which was *most copied after its successful operation.*

34

PLANNED CHANGE
Change strategies

ANALYSIS AND SUGGESTIONS

Bobbe, R. A., and Schaffer, R. H. Mastering change: Breakthrough projects and beyond. *American Management Association Bulletin,* 1968.

Purpose

A prescription for achieving change.

Method

The ideas in this article are based on the broad experience and observations of the authors.

Findings and Conclusions

1. There are five characteristic responses to the need for change:

(a) Concentration on preparing for a change.
(b) Delegation of organizing and carrying out change to consultants or to staff.
(c) Focusing on one element of change alone.
(d) Deferring action for a more auspicious time.
(e) Major surgery.

2. These responses are all inadequate either because they take too little action too slowly or too much action too hastily. The only reasonable approach is a gradual expansion of management's capacity to carry out change while also performing the present job. In industry, this approach characterizes organizations which survive and prosper for generations.

The essential ingredients in this strategy are:

(a) Developing achievable breakthrough projects.
(b) Giving written assignments.
(c) Requiring written work plans.
(d) Instituting innovative action.
(e) Providing methods for reviewing and controlling the work.
(f) Instituting steps to create an expanding sustaining process.

3. An elaboration of these steps follows:

(a) *Breakthroughs* — a breakthrough project should respond to an immediate need of the organization. It should be achievable with the current resources of the organization. It should be a tangible step toward key long-range objectives.

(b) *Written assignment*—it should contain at least the following elements: a general statement of long-term objectives; a clear definition of the assignment with specific responsibilities; a request for a work plan outlining specific steps; a detailing of resources and methods available; specific measures of progress; checkpoints and completion dates; methods of reporting progress.

(c) *Written work plan*—this outlines how the individual or group intends to accomplish the goals. It should include specific steps in the assignment, names of those responsible for each step, dates by which each step is to be completed, and clear statements of how performance of each step will be measured. This is the action phase of the initial planning written assignment.

(d) *Instituting innovative action*—success here requires people to experiment with new ways

of collaborating to plan work and get it done. Often it is desirable for task forces to repair to an extra-work setting to get the project started.

(e) *Reviewing*—reviews should be periodic, keyed to checkpoints in the work plans. Informal review sessions might well occur more frequently than formal reviews. When roadblocks are encountered, as they always will be, methods of dealing with them must be developed; this leads to the next stage of expanding the process.

(f) *Expanding the process*—the assignment may need to be reshaped or added to; the time dimension may need to be altered; the manager may need to expand his control. The whole move toward creative, innovative management can be fostered by adding projects related to the initial breakthrough project. Involving other departments and other people over the course of time also fosters this innovative process. The authors cite the example of a community hospital that had come to a standstill because its doctors, administrators, and trustees could not collaborate. To help overcome this, projects were organized around three problem areas where all agreed action was needed. A task force with representatives from each group were given written assignments. All groups made useful progress and gained positive experience in working together. It was felt the logjam had been broken; however, nobody did anything to take the next step, and over time the momentum faded and the old frictions reappeared. Luckily, one trustee seized the initiative and got the hospital leadership together to plan the next steps, which were to move into tougher, more far-reaching decision areas in the same task force method involving more people. This procedure of selecting increasingly ambitious goals did, in fact, move the hospital to a creative stance. Success fosters success.

35

INNOVATION: MENTAL HOSPITAL

Innovation and marginality
Innovative transfer

CASE STUDY

Borman, Leonard D. The marginal route of a mental hospital innovation. Paper presented at the annual meeting of the Society for Applied Anthropology, Lexington, Ky., April 1965.

Purpose

Borman analyzes the effects of a marginal* population introducing an innovation to the more influential and socially accepted members of a social system.

In essence this is a report of a case study that involves an innovation (a novel form of a patient council) which was initiated in a mental hospital by socially marginal professionals (members of the recreation and anthropology departments). The groups of patients through which they initiated their innovation were also marginal in that they were considered backward and chronic.

*Marginal individuals are those who are perceived as deviating from the norms of a given system.

Method

Observation seems to be the principal method used in gathering information for analysis. The author describes the "nonthreatening" manner in which the patient councils were introduced and the processes involved in moving the innovation from marginal acceptability to system acceptability.

Findings and Conclusions

1. The innovation was introduced among the "discarded" patients so that this would not pose a serious threat to the customary values and practices of the hospital. Since to many the patient council appeared to resemble play activities, few of the "prestigeful" professionals attended patient council sessions.

2. Four processes played important roles in transforming this marginal innovation to one of higher regard and acceptability.

(a) Shortly after the initial patient council the chief of the recreation department encouraged the spread of patient councils throughout the hospital. The chief prodded all recreation specialists to establish these councils. Eventually a hospital-wide advisory council was established, with weekly meetings. This council further served to stimulate other wards and units to adopt the innovation. Since it was still perceived as a play activity much of the threat that often accompanies an innovation was reduced.

(b) Eventually the research interest in patient councils and the resulting activities stimulated further acceptance. The university students involved in researching the effects served a linking function, in that they made the innovation understandable to others in the hospital.

(c) Many of the hospital staff were disillusioned with some of the arrangements for treating and organizing the care of patients. (A felt need for improvement was obvious.) Patient councils helped to symbolize one kind of resolution to some of the dilemmas; thus, more interest was stimulated.

(d) The patient council innovation also became more important through its identification with the outside therapeutic community movement. The local patient council innovations became identified with this outside movement in two ways: (1) through the distribution within the hospital of literature drawn from the larger movement, and (2) through consulting visits and lectures by many of these same professionals.

3. Borman stresses the importance of the role the researchers played in this case study. Their rather undefined roles made it possible for them to communicate freely with all segments of the hospital bureaucracy. They played a vital role in gaining system acceptance for the innovation.

36

CONSULTANT ROLE
Change motivations
Community research

ANALYSIS AND SUGGESTIONS

Bowman, Paul H. The role of the consultant as a motivator of action. *Mental Hygiene*, 1959, 43, 105-110.

Purpose

Bowman examines the various methods of motivation used by the consultants to a 10-year community research project in which the role of the consultant was a central variable. He explores the successes and failures of the various methods of motivation and suggests optimal uses for the different methods.

Method

The author's observations and opinions are based on his field experience.

Findings and Conclusions

1. Bowman sees two basic functions for the consultant—

(a) the knowledge function, which involves analyzing problems and bringing resources to bear that can help in the solution thereof; and,

(b) the motivation function, which involves helping individuals define their problems, mobilize their own resources, and carry out action programs.

2. The following motivational methods are based on external factors:

(a) *Authority method*—the authority of a consultant comes from the support of influential persons and the informal authority of his position and status. It is based on acceptance of the consultant by the power structure of the community. Motivation through exertion of authority is usually most evident in the

initial phases of project development.

(b) *Emotional contagion method*—this method of motivation stems from the enthusiasm of highly involved individuals. These individuals act as catalysts and stimulate the enthusiasm and involvement of other community members. The author does not see emotional contagion as a manipulable type of motivation, but rather as a natural expression of feelings toward the goals and objectives of the project.

(c) *Reward and punishment methods*—either rewards or punishments can be used as motivating forces. Punishments were not utilized in this project. Several different types of rewards were employed. Academic course credit was offered, as was aid in helping local schools obtain grants, recognition of work accomplished in the form of scholarships, invitations to speak at the university, and coauthorship of forthcoming articles. The author warns that the reward can become more important than the goals.

3. Internal sources of motivation can also be tapped. This method appears to be primarily related to aiding individuals assess their own needs. Opinion surveys and demonstration activities were mentioned as possible tools for helping individuals see their own problems and needs and possible solutions to them.

37

INNOVATION: EDUCATION

Change process
Organizational factors
State organization for change

EMPIRICAL STUDY

Brickell, Henry M. State organization for educational change: A case study and a proposal. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 493-531.

Purpose

This article deals with the second of two related studies, with a brief introductory comment about the first. The two studies comprised: (1) an inventory of new instructional programs being used in elementary and secondary schools in New York, and (2) an analysis of the dynamics of instructional innovation. They were to lead to recommendations for statewide action to accelerate the pace of change, and to improve its direction, without diminishing local control of education. Both studies focused exclusively on innovations which require significant shifts in the normal arrangement of six major structural elements of a school: teachers, students, subjects, methods, times, and places; e.g., television, team teaching, ungraded classes. The findings of both studies apply to instructional programs of that type rather than to classroom practice.

The first study determined that while the rate of innovation doubled within the 15 months following Sputnik I, the great bulk of schools as structured institutions had remained stable and unchanged. The second study set out to discover the reasons for that structural stability, to identify any forces powerful enough to loosen it, and to suggest a new pattern of State organization which would make the modification of instructional arrangements rational, rapid, and continuous.

Method

The writer conducted unstructured interviews in 31 public school systems of all types and sizes in New York, and five selected districts in other States. He visited approximately 100 schools and 1,500 classrooms. He visited 13 college and university schools of education, nine regional college-affiliated school study councils, the New York State Education Department, schools of medicine and agriculture, and a wide variety of professional, commercial, and school-related citizens' organizations. The findings and recommendations which follow depend entirely on these interviews for their support.

Findings and Conclusions

1. The key conclusion drawn is that the design, evaluation, and dissemination of innovations are three distinctly different, irreconcilable processes. The circumstances which are right for one are essentially wrong for the others.

(a) The design state requires a specially prepared environment which would not be found normally: a group of highly intelligent people; a limited problem; adequate time, money, and resources; and the freedom to experiment with new methods.

(b) In the evaluation stage, rather than freedom to experiment, the evaluator needs to be able to control, or at least to assess accurately, those forces which might influence the success of the new approach.

(c) The dissemination stage calls for an "everyday" situation, in which the observers may see clearly that the new approach will be effective in their own schools and communities. Anything which the observer could label "abnormal" or "unrealistic" is sufficient to rob the observed program of persuasive effect.

2. Friction is common among people concerned with innovation (e.g., between the State men managing the education department's fund for local experimentation and the local men spending it).

3. The conclusion reached from adding (1) and (2) above is that failure to distinguish the three phases of change is the most formidable block to instructional improvement today.

4. The distinctions between design, evaluation, and dissemination are better recognized and separated in medicine, agriculture, and industry than in education.

5. The process of local educational change is determined by the relationships between and within two groups: (a) the public and the board of education, external to the institution; and (b) the administrators and teachers, internal to the institution. Rearrangement of the structural elements of the institution depends almost exclusively on administrative initiative, because that is the source of authority.

6. Classroom teachers can make only three types of instructional change in the absence of administrative intervention: (a) change in classroom practice, (b) relocation of existing curriculum content, (c) introduction of single special courses at the high school level.

7. Few new instructional programs are invented in any school system. Most local changes involve adopting or adapting something the neighbors are doing.

8. Suspicion is widespread regarding the worth of innovations in other schools; the most persuasive way of learning about an innovation is that of *visiting* a successful program and observing it in action (see 1-c above).

9. The most successful innovations are those which are accompanied by the most elaborate help to teachers as they begin to provide the new instruction.

10. Except for their role in training teachers, the colleges and universities have little influence on instructional innovation in elementary and secondary schools.

11. Commercial organizations, such as textbook publishers, are extremely powerful. When they promote an instructional change, a great wave of influence sweeps the schools. On the other hand, once they begin to market a given product, they serve as powerful inhibitors of further change, because they seek volume distribution and repeated sales of the same product.

12. *Outcome*—the report on the dynamics of instructional innovation concluded with a new plan for State organization, based entirely on the findings presented in this article.

(a) The recommendations made two basic assumptions: (1) that the solution would have to be accomplished largely with the people and the funds already available; and (2) that the factors influencing instructional change could not be altered appreciably, and that they would have to be guided, not opposed.

(b) The plan was set up to use generalists to fill long-range permanent positions and specialists to fill short-term temporary positions. The heart of the proposal was that separate circumstances be deliberately created for the design, evaluation, and dissemination of new instructional programs.

(c) Dissatisfaction with the recommendations, within one year after publication of the report, was evenly distributed among all types of organizations. However, the general reaction of the people who were not strongly identified with the specific existing structures was that although the report was not correct in all its conclusions, it merited very serious study.

(d) Some ten months after the publication of the report, the commissioner of education announced that plans were underway to estab-

lish a semiautonomous research unit to stimulate and finance the design and evaluation of new instructional programs and new methodologies in the schools.

38

RESISTANCE TO CHANGE: TECHNOLOGICAL

Resistance reduction
Innovation

CASE STUDY

Bright, James R. *Research, development, and technological innovation: An introduction.* Homewood, Ill.: Richard D. Irwin, 1964.

Purpose

This book is a compilation of papers dealing with technological innovations. It is intended to provide case studies and examples of the principles of change. The one chapter relevant to mental health is entitled "Resistance to Technological Innovation."

Method

In the chapter on "Resistance to Technological Innovation," the author abstracts principles from the case studies. This is not a documented analysis, but a subjective distillation.

Findings and Conclusions

1. Major reasons for resistance to change are:

(a) To protect social status or prerogative.
(b) To protect an existing way of life.
(c) To prevent devaluation of capital invested in an existing facility.
(d) To prevent a reduction of livelihood because the innovation would devalue the knowledge or skill presently required.
(e) To prevent the elimination of a job.
(f) To avoid expenditures, such as the cost of replacing equipment, renovating, modifying systems to accommodate the innovation.
(g) Because the innovation opposes social customs, fashion, taste, habits of everyday life.
(h) Because the innovation conflicts with existing laws or rules.
(i) Because of the rigidity inherent in large, bureaucratic organizations.
(j) Because of personality, habit, fear, equilibrium between individuals or institutions, status, and similar social and psychological considerations.
(k) Because of the tendency of organized groups to force conformity.
(l) Because of reluctance of an individual or group to disturb the equilibrium of society or the work atmosphere.

2. The first question in a resistance study is to consider each of the above categories relative to the particular innovation. Then, once you have identified possible sources of resistance, you can consider the means useful to minimize resistance.

3. The following recommendations for introducing change are made:

(a) Minimize threat, since resistance will be in proportion to the threat people feel.
(b) This would thus suggest that innovations should be introduced in stages since resistances are lessened if only slight changes are required.
(c) Innovations should be made in places where people are accustomed to frequent changes.

39

KNOWLEDGE DISSEMINATION
Information needs
Change agency

ANALYSIS AND SUGGESTIONS

Burchinal, Lee. Needed: Local, one-stop information centers. *Educational Researcher,* Special Supplement, 1967, 8-9.

Purpose

To present the need for and the functions of local educational information centers.

Method

The author bases his suggestions on his analysis of information needs in education.

Findings and Conclusions

1. There is need to supplement the services of ERIC by the establishment of small, local information centers.

2. These local centers could serve four functions:

(a) Become familiar with all large-scale, pertinent sources of knowledge.
(b) Know the operational requirements of the several information systems.
(c) Act as intermediary between the user and the systems.
(d) Be able to provide feedback from the users to the systems.

3. The settings for the centers would be regional laboratories, State agencies, and large school systems. A full-blown center would require several full-time specialists and probably a clerk-typist or secretary. Although ERIC service and tools would comprise an important part of the operation of local information centers, independent funding would be required.

40

CHANGE STRATEGIES
Individual reeducation

ANALYSIS

Burke, Edmund M. Citizen participation stategies. *Journal of Ame. ican Institutional Planners.* September 1968.

Purpose

This is a rational discussion of five strategies of change.

Method

The ideas in this article are based on the broad experience and observations of the author.

Findings and Conclusions

Effective change strategies require knowledge and skill in handling the dynamics of individual and group behavior. While seeking to maximize rationality, the staff has to be sensitive to individual differences, involve people in organizations and encourage them to participate in order to allay their fears, gain their advice and seek their cooperation. Five strategies of change may be identified:

1. *The education therapy strategy*, in which participation focuses upon the presumed need for improvement of the individual participants. In this instance, task accomplishment is irrelevant; rather the participants become clients who are the objects of treatment. The problem with this strategy is its inability to accommodate organization demands; the focus is on the means rather than the end.

Changes may occur among the individual participants but not be translated into organizational goals.

2. *The strategy of behavior change,* which is deliberately aimed at influencing individual behavior in order to change group behavior. The objective is to induce change in a system by changing the behavior of the system's members in general or of influential members in particular. Since people in groups resist decisions imposed upon them, participation in the decision-making process can help them create commitment to new objectives. The awareness of the need for change and pressure for change must come from within the group, from a shared perception held by the members. Facts, data, and persuasion are not enough. If system representatives can influence change in their own reference groups, this strategy is a highly effective model for planned change. Experiments in industry with this strategy have been quite effective.

3. *The strategy of staff supplements* involves the use of skilled volunteers as a supplementary staff. This strategy depends upon the classical notions of rationality and planning about which there is now considerable doubt. The advice of a professional often becomes merely another opinion.

4. *The strategy of cooptation,* despite the usual disparaging connotation attached to it, does provide a means for achieving social goals. Groups not normally included in policy making are given an entree to the decision-making arena. This also increases the opportunity for organizations to relate to one another and find compatible goals.

5. *The community power strategy* works best for organizations committed to a cause rather than to specific issues or services. This strategy essentially involves power confrontations. The interpersonal problems in this sort of method usually reduce its effectiveness.

41

ORGANIZATIONAL CHANGE
Change strategies
Individual reeducation

ANALYSIS

Burke, W., and Schmidt, W. Primary target for change: The manager or the organization? In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes, and R. J. Lewicki (Eds.), *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

The author presents a way of comparing two approaches to improvement of managerial effectiveness and organizational functioning: (a) management development (the educational development of individual managers), and (b) organization development (the development of the organizational unit).

Method

Analytic discussion, in which the author compares management development with organization development with regard to goals, difficulties in initiating, strategies for change, staff and time requirements, and problems involved.

Findings and Conclusions

1. The effective organization must have both management development and organization development.

(a) Management development and organization development are complementary processes.
(b) Management development is seen by the authors as only one significant facet of organization development.

2. Management development strives toward developing managers who will be able to contribute more to the organization, while organization development attempts to create conditions under which managers can make these contributions.

3. Organizational development requires total system involvement, commitment to long-term re-

newal efforts, and is accordingly more difficult and involves greater risk.

4. The strategy for change in management development is to improve the individual manager's knowledge and skill, and possibly to change his attitudes. Typical interventions are of an educational nature, e.g., courses, conferences, seminars, etc.

5. The strategy for change in organization development is to develop processes that will assist in the diagnosis of organizational problems, in the planning of solutions, and in the implementation of remedial plans.

6. Staff requirements are more severe in organizational development; the practitioner of organization development requires a wider range of skills than is required for the practitioner of management development.

42

IN-SERVICE EDUCATION: HEALTH FIELDS

Individual reeducation

ANALYSIS AND SUGGESTIONS

Cady, Louise L. The philosophy of in-service and continuing education. *Mental Hygiene*, 1968, 52, 456-461.

Purpose

This article is a plea for in-service and continuing education in health fields. The author analyzes the current relationships between in-service education and the health fields and then makes a series of suggestions for implementing better in-service programs.

Method

The findings in this article are based upon the author's experiences and observations.

The author defines in-service education as "education that is imparted and obtained while one performs the task . . . education for the job with the least practical interruption of performance of the job."

Findings and Conclusions

1. *Present Status of In-service Education in Health Fields.*

(a) There is a limited supply of trained individuals. As the most capable are promoted and assume higher duties, gaps in service are created. More and better in-service education is needed to adequately train individuals to assume the responsibilities and duties of vacated positions.

(b) Administrators often argue, "Our people are needed to do the job. We cannot spare them. It costs too much to have our staff off a half day each month for education conferences." Mrs. Cady points out that while this may be very true, community changes, changes in need for services, new research developments, etc., all indicate that there must be provisions for on-the-job training. ". . . An employee once trained is not trained 'for always.' "

(c) Too many individuals are assigned to jobs for which they are not specifically trained and then left to sink or swim. As a result the job, the work, or both, suffer.

(d) Most individuals being "turned out" of the schools are not endowed with the philosophy that education is a continuing process. Individuals should be trained to think of education as something they will continue rather than terminate with graduation.

(e) Current in-service training is aimed primarily at individuals assuming new positions. Workers already part of the system are not given the benefits of in-service education. New developments and discoveries are made of which the "old" worker needs to be made aware.

(f) Often institutions and agencies are defensive about their images. In-service education can help such organizations to become insightful rather than defensive about the difference between the agency's self-image and its true image.

(g) Often there is an intellectual acceptance by the institution or agency directors of the need for continuing education, but no "arrangements" are made to provide such training. "With no planned direction and supervision, a worker may accumulate year after year of the same experience, with no professional growth or improvement in patient care."

2. *Suggestions.*

(a) Develop exchange programs within or between agencies to fill training and experiential gaps. "An exchange program cannot only increase competencies, but it may also bring about coordination and continuity of services."

(b) Encourage staff attendance at educational meetings. Make specific plans designed to suit the particular needs of each division.

(c) Incorporate 15-minute daily or half-hour weekly sessions into the work schedule. Such sessions should include demonstration and practice with new ideas and techniques.

(d) Use available audiovisual materials such as educational television and programmed instruction. Condense relevant articles in central offices and relay to workers via tape recordings, records, or telephone.

Mrs. Cady concludes, "In mental health there seem to be two needs: a new pattern for continuing education, and a new use of the materials at hand for such education."

43

EVALUATION OF TRAFFIC REFORM

Social experimentation
Research methodology

CASE ANALYSIS

Campbell, Donald T. Reforms as experiments. *American Psychologist*, 1969, 24, 409-429.

Purpose

This is a discussion of the ways in which social improvements in a community or in an institution can be evaluated for their effects on a variety of indices. Recognizing that administrators need to make their decisions "look good," Campbell, nevertheless, thinks it is possible to stage reforms in such a way that they can serve as experiments. He discusses some of the common sources of misinterpretation of trends in social indices following a reform and proposes ways in which these misinterpretations can be avoided.

Method

Campbell uses the enforcement crackdown on speeders that Governor Ribicoff of Connecticut instituted in 1953 as an illustration of some of the possibilities of evaluation of such a reform and some of the difficulties as well. He takes trends in a number of traffic measures over the period from 1951 to 1959.

Findings and Conclusions

1. There was a striking drop in Connecticut traffic fatalities from 1955 to 1956 but it is possible to think of a number of explanations for this besides the enforcement crackdown:

(a) *Maturation or preexisting trends in the community*—it may have been that fatalities were going down anyway and taking one year-to-year segment just capitalizes on a general trend rather than demonstrating the effects of a reform which happened to come in one of the years when the trend was operative. An analogy from mental health would be treatment taking credit for all of the increasing independence we see in young people in the course of their adolescence.

(b) *Instability of measures*—there may be a great deal of variability in the measure to begin with so that year-to-year variations may have less significance. Thus, if a number of measures of ward morale go up and down in the absence of any planned change,

one would be more cautious in interpreting an improvement in morale consequent upon the introduction of a new patient policy.

(c) *Regression effects*—with an oscillating index the tendency after a high value is toward a lower one; after a low value toward a higher one. The speeding crackdown followed a year of unprecedentedly high traffic fatalities. Applied to mental health, if we take a group of patients at their most depressed and start a new treatment, we should expect improvement, but this improvement may be more a reflection of the regression of mood values toward the mean than any treatment effect.

(d) *Instrumentation artifacts*—sometimes reforms bring changes in the process of measurement itself. Mental health education may bring about an increase of people seeking treatment, so that if the number of patients per capita is our index of general mental health we may conclude erroneously that the education has *worsened* mental health. This effect is particularly apparent in crime statistics. An upgrading of the Chicago police force in 1959 made for better recording of petty thefts with the results that by this index the reform seemed to have increased crime!

2. To overcome these stumbling blocks in evaluation Campbell makes a number of suggestions.

(a) He favors true experiments rather than quasi ones, but recognizes true experiments are not always possible.

(b) If a new policy or treatment is to be introduced he suggests randomized selection of the units which are to try it out.

(c) Each pilot unit should be matched with a control one and the same measures taken before and after on both. Where this cannot be done it may be possible to have staged innovation within an administrative area so that those units which receive the innovation last can serve as controls for those who receive it first.

(d) Where only some individuals receive a treatment he suggests selecting them randomly so that the remainder are a valid control group.

(e) Where selection for treatment is based upon prior measures (as, for example, might occur with scholastic aptitudes scores in education or with ego-strength measures in psychotherapy), then future achievements or adjustment of the two groups can be compared by a regression discontinuity design which he describes in some detail.

(f) It makes little difference whether the best bets are selected—as they are in education—or the worst bets—as they might be in psychotherapy. The design enables the administrator to disentangle the effects of preexisting capacities from the effects of treatment.

3. The article ends with some candid advice for trapped administrators who have to show good results from their innovations.

44

CONSULTANT ROLE
Change process: mental health
Consultation measures

ANALYSIS AND SUGGESTIONS

Caplan, G. *The theory and practice of mental health consultation.* New York: Basic Books, 1970.

Purpose

1. To describe the boundaries and goals of consultation between mental health specialists and care-giving professionals and organizations.

2. To detail techniques of consultation "so that they can be taught and learned and so that they can be recorded, evaluated, and improved."

3. To formalize and professionalize certain aspects of mental health consultation.

Method

Analytic and didactic, based on the author's broad experience in over 20 years of teaching and consulting to schools and mental health systems.

Findings and Conclusions

1. *Definition of mental health consultation*—"consultation" refers to the interaction between two professionals concerning a lay client or a program for such clients. Caplan differentiates consultation from other specialized methods, such as supervision, education, psychotherapy, case-work, counseling, etc. He summarizes the characteristics of consultation, stressing that (a) it is a coordinate or peer relationship between members of two professions, rather than a profession in itself; and (b) it does not focus overtly on personal problems and feelings of the consultee.

There are four types of consultation:

(a) client-centered case consultation, in which the consultee and consultant discuss a particular case or group of cases;
(b) consultee-centered case consultation, which focuses on the consultee's difficulties in handling a case or cases;
(c) program-centered administrative consultation, which aims to plan or improve a program; and
(d) consultee-centered administrative consultation, which deals with organizational difficulties, such as leadership or communication problems.

2. *Developing a consultation program in a community*—Caplan discusses the following steps in helping to formulate an institutional plan:

(a) establishing a basic philosophy and mission;
(b) developing a conceptual framework (a purpose statement within which goals may be formulated);
(c) exploring goals with community leaders;
(d) choosing target institutions for a consultation program;
(e) promoting initial contacts; and
(f) distributing efforts among community agencies.

3. *Building relationships with a consultee institution*—preparing a consultation program in a caregiving institution involves the complicated process of building relationships. Caplan discusses this in detail, including:

(a) building channels of communication;
(b) recognizing obstacles to communication, i.e., conflicts of interest and distortions of perception and expectation;
(c) dissipating these distortions;
(d) arousing trust and respect;
(e) recognizing distortions of the consultant;
(f) developing a common verbal and nonverbal language;
(g) establishing ground rules for collaboration;
(h) perceiving successive stages in the specialist role; and
(i) pursuing common methodological issues.

4. *Building the relationship with the consultee*—the consultee must be open to the consultant's point of view but, at the same time, must be sufficiently independent to accept only that portion which he finds useful. Caplan points out that the consultant serves as a role model and that relationship building is a directed process. Detailed suggestions are given, including:

(a) getting to know the consultee;
(b) fostering his self-respect;
(c) dealing with his anxiety about the case and about the consultant;
(d) clarifying the consultation contract;
(e) maintaining confidentiality;
(f) keeping the consultee from feeling inferior ("one-downsmanship"); and
(g) avoiding psychotherapy (seven techniques).

5. *Client-centered case consultation*—this is the traditional type of specialist consultation, as between doctors consulting on a medical case. The process includes: (a) consultation request; (b) assessment of the consultation problem, i.e., assessment of the client and the consultee setting; (c) the consultation report; (d) implementation of the consultant's recommendations; and (e) follow-up.

6. *Consultee-centered case consultation*—this type of consultation aims frankly at educating the consultee. Caplan lists four common reasons for the consultee's needing this kind of consultation: (a) lack of knowledge, (b) lack of skill, (c) lack of self-confidence, and (d) lack of professional objectivity.

Lack of professional objectivity often occurs in one of five overlapping categories: (a) direct personal involvement, (b) simple identification, (c) transference, (d) characterological distortions, and (e) theme interference.

7. *Techniques of theme interference reduction*—a "theme" is a conflict, related to the experience or fantasies of the consultee, that has not been resolved and persists in the preconscious or un-

conscious as "an emotionally toned constellation." These unsolved problems are often displaced onto task situations, producing a temporary loss of emotional stability or temporarily ineffectual behavior. Illustrating his explanation with several cases, Caplan details three steps in his techniques: (a) assessment of the theme, (b) the consultant's intervention, and (c) termination and follow-up.

8. *Program-centered administrative consultation*—focusing on an organization's problems, the consultant assesses the significance of the relevant factors, and then reports his recommendations for dealing with it. As with the other types of consultation, Caplan presents much detail concerning techniques. In this chapter he also deals with the question "Why should the administrative consultant be a mental health specialist?"

9. *Consultee-centered administrative consultation*—in helping the consultee organization improve its organizational processes, the following steps are suggested: (a) choosing the consultees, (b) initiating contact with the organization, (c) building relationships, (d) studying the social system, (e) planning the intervention.

The following are common interventions: (a) extending the consultee's cognitive field, (b) increasing mastery of feelings, (c) improving communication, (d) reducing perceptual distortions, (e) improving leadership, (f) bringing personal and organizational needs together, and (g) improving interpersonal skills.

10. *Evaluation*—Caplan's stated purpose in writing is to formalize what is known about mental health consultation so that it can be transmitted and improved upon. In this chapter he discusses how that knowledge is to be gathered. He discusses both the practitioner's rough assessments of changes in consultees, clients, and organizations, and evaluation by research specialists through more systematic procedures.

11. *Training in mental health consultation*—the author describes the formal program which he uses at the Harvard Medical School, and discusses various kinds of seminars, practices, and supervision. Caplan also discusses informal training programs.

12. *Mental health consultation and community action*—working with a community requires different theory and techniques than those used with formal organizations. Caplan discusses conflicts and confrontations that were beginning to appear in the community in the late sixties and presents several approaches which mental health workers might use in these new situations.

45

DIFFUSION RESEARCH

Change process
Innovation: life cycle
Innovation: education

ANALYSIS

Carlson, Richard O. Summary and critique of educational diffusion research. Paper presented at the National Conference on the Diffusion of Educational Ideas, East Lansing, Mich., Mar. 26-28, 1968.

Purpose

Carlson summarizes and critiques the educational diffusion research done to date, pointing out its deficiencies and areas for future research.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

Adoption is defined as the decision to use a new idea or practice, and diffusion as the spread of a new practice to and among potential users. Carlson maintains that the terms "adoption" and "diffusion" describe only a very narrow slice of the world of change in education. The life cycle of an innovation must consist of the story of the invention, development, promotion, adoption, diffusion, and demise of the innovation, along with an ac-

count of the problems encountered and solutions developed in introducing and maintaining the innovation in the school setting, as well as the unanticipated consequences growing out of its use. To date most studies have focused only on the adoption and diffusion aspects of the process.

Carlson isolates seven elements in the diffusion process and focuses on current research inadequacies. He points out that no single diffusion study has taken into account all seven elements.

1. *Acceptance*—the problems encountered in this area are definitional: What is acceptable as evidence of acceptance? Are results comparable? Who makes the decision to adopt? What procedure is followed in the decision-making process? Some research on decision-making processes in education has been computed, but the need for good descriptive studies of acceptance decisions still remains.

2. *Time*—regardless of the centrality of time in diffusion studies, few adequately identify the time of the acceptance decision.

3. *The innovation*—there are two major problems encountered in specifying new educational practices to study in diffusion research: (a) the classification of educational innovations in order to make results generalizable, and (b) the definition of what constitutes a new practice.

4. *Adopting units*—most studies of educational diffusion focus on the local school system as the adopting unit, neglecting the individual teacher, and the varying adoption rates among individual schools within a school system. In addition very limited attention is paid to concepts related to organizational theory.

5. *Communication channels*—Carlson points out the difference between diffusion studies and adoption studies. Adoption studies deal with who adopts and at what rate. Diffusion studies focus on how an innovation spreads, or the extent to which and the rate at which an innovation spreads from its source to and among potential adopters.

Educational studies, for the most part, neglect the fact that communication plays a different role in each of these processes.

6. *Social structure*—communication and social structure are closely linked. Only one educational study involved social structure as an explanatory variable both in terms of adoption and diffusion.

7. *System of values or culture*—according to Carlson, no reseacher has drawn upon culture or values to aid in accounting for the spread of educational innovations or rates of adoption.

46

CHANGE PROCESS: SOCIAL

Communication process
Change strategies
Change in attitudes

CASE STUDY-ANALYSIS

Carmack, William R. Communication and community readiness for social change. *American Journal of Orthopsychiatry*, 1965, 35, 539-453.

Purpose

To describe the preparation of the Dallas, Texas, community for the acceptance of desegregation as a case study in the effective application of communication theory.

Method

The concerted program is presented in detail in relation to the basic components of the communication process.

Findings and Conclusions

1. The organization and functioning of an extensive, nonpolitical citizens' council are described. Meticulous planning, widespread participation, the establishment of universally appealing supraordinate goals, and the use of reference groups marked the effort to influence community acceptance of the desegregation idea.

2. Illustrative applications of the components of the communication process are presented under

the rubrics of: (a) the *who*; (b) the *what*; (c) the *channels*; and (d) the *to whom* of communication.

3. Noteworthy considerations regarding the source, or the *who*, of communication include the use of credible sources entailing the cooperation of opinion leaders of all relevant community groups.

4. Civic pride was selected as a central theme with regard to content, or the *what*, of the message. Detailed positions on crucial issues were worked out carefully in advance, and a concerted point of view was adopted and expressed.

5. As to the channel, or *how*, of communication, in addition to the massive and diversified utilization of the media of films, radio, TV, booklets, newspapers, and leaflets, a good deal of personal contact was employed at various stages of the process.

6. The target groups, or the *to whom* aspect, were carefully considered in adapting the means employed in conveying the intended message.

7. The Dallas effort is reported as having been highly successful at least in its early stages, more so among the white citizenry than the black. Long-range effectiveness was noted as unclear at the time of writing.

47

ORGANIZATIONAL FACTORS
Departmental relations: medical schools
Innovation correlates

EMPIRICAL STUDY

Carrole, Jean. A note on departmental autonomy and innovation in medical schools. *Journal of Business*, 1967, 40, 531-534.

Purpose

The author attempts to determine which of a number of variables are associated with innovation in medical schools.

Method

Medical schools were first classified as either innovative or conservative on the basis of curriculum change. To qualify as an innovating school, a medical school must have initiated revision of its curriculum, of broader than departmental scope, between 1959 and 1964. Those not meeting this criterion were classified as conservative schools. From a population of 85 medical schools,* seven were found to classify as innovating schools.

Measures of 18 variables related to size and composition of the student body and of faculty and administrative personnel, to volume and sources of support of research, and to number and location of clinical facilities were obtained from all 85 schools.

Findings and Conclusions

1. The power structure in many medical schools is changing. In the past medical schools were organized around departments, each with a field of study in the curriculum. For many years department chairmen and certain of their faculty secured research funds and thereby wielded the power. With the entrance of the government into allocation of research funds, a change was made. The funds were allocated to the schools themselves, rather than to departments or individuals. The balance of power, therefore, shifted and departmental autonomy is gradually eroding away in the more innovative schools.

2. Innovative schools were found to have the following characteristics:

(a) Innovative medical schools have larger faculties than conservative medical schools.
(b) Innovative schools had more part-time faculty than conservative schools.
(c) Innovative schools had a larger number of departments in the basic sciences and clinical areas.

3. *Author's discussion of findings*—the larger faculties of the more innovative schools are more likely to bring a greater number of innovative ideas and practices into being. The larger number of departments within the innovative schools means a

*The basis of selection for inclusion in the 85 schools surveyed was not mentioned in the article.

greater opportunity for interdepartmental exchanges. The fact that many of the faculty members in the innovative schools are only part time means they are probably more in touch with the happenings in the practical world of medicine and therefore good links between the medical school and innovations being developed in the "real world."

48

KNOWLEDGE UTILIZATION
Utilization projects
Utilization measures

CASE ANALYSIS

Carter, Launor F. Knowledge production and utilization in contemporary organizations. In T. L. Eidell and J. M. Kitchel (Eds.), *Knowledge production and utilization in educational administration.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1968, pp. 1-20.

Purpose

Concerned with the lack of research payoff to the larger community, Carter highlights the problem, explores the results of four projects that have dealt with research utilization and offers some suggestions on how knowledge can be used in attacking major contemporary problems.

Method

The ideas in this chapter are based on the broad experience and observations of the author.

Findings and Conclusions

1. *Information Transfer as a National Problem*—the results of basic and applied research and technological innovation are reported in numerous documents, journal articles, government reports, books, etc. The number of these and the difficulties in making them available for use have been increasing for years. The problems confronting a national document handling system are numerous.

> . . . it seems probable that even if they (national document handling system) were successful, we would still be faced with serious difficulty in implementing the knowledge which has been gained. Frequently, the knowledge available in reports is not easily translatable into practical application. Often the carefully reported results are so narrowly restrained or so confined to the laboratory setting that their implications for real problems are, at best, tenuous.

2. *Projects Dealing with Research Utilization*—in the last few years several research projects have confronted the problem of moving research results from the library shelf into a functioning role in relevant real world situations.

(a) *Project Hindsight*—done in the Department of Defense, this research study yielded information that indicated a lack of orderly process from research to development. It was found that 91 percent of events could be classified as science. This finding leads one to the almost inescapable conclusion that if a technical development is to take place and it is limited by current technology, then the way to solve the problem is to directly attack it in terms of the then-known science and advanced technology rather than to hope that basic science will, in any short time period, provide the new knowledge required to lead to a successful system development.

(b) *Tacoma Project*—this study focused on the dissemination of information and adoption of techniques developed during a successful demonstration project. Glaser and his associates studied the efficiency of various methods of communicating the results of this study, and reported the following results.

(1) If promising research or demonstration findings are reported in easily readable,

brief and nontechnical form, and are widely distributed to potential users, the chances of their having impact and being used will be increased relative to reporting through a formal report.

(2) If potential users of the research or demonstration findings attend a conference that involves discussion and a site visit, use of the innovative research or demonstration techniques is significantly facilitated, especially if there is an opportunity for conferees to exchange information about their own innovative practices.

(3) A visit by a member of the demonstration project staff to rehabilitation workers who have heard about and seen the innovation further promotes the use of the innovation.

(4) Psychological consultation to management helps the organization change more rapidly and become more open to change.

(c) *Traveling Seminar Project*—the System Development Corp. tested the feasibility of conducting traveling seminars and conferences as a technique for increasing innovation in education. Essentially the treatment consisted of groups of 30 educators visiting selected schools where significant innovations had been introduced and had been in operation for more than one year, after which they met for a conference on the dynamics of educational change. The participants expressed great enthusiasm for this technique. The formal evaluation based on informal reports, and a controlled before-and-after interview and questionnaire indicated that participating districts had a higher innovation score than did the nonparticipating districts.

(d) *Translating laboratory research*—working from the field of psychology, Mackie and Christensen undertook the task of describing the processes involved in translating the results of laboratory research into forms that would be meaningful and useful in operational settings. In their findings they state:

> It was found that the research-to-application process never has properly developed for the psychology of learning. Consequently there have been far fewer applications and much less impact on the educational process than might reasonably be expected . . . The reasons are believed traceable, in large part, to the research philosophies of experimental psychologists. But it was evident also, that potential users have been reluctant to make the effort necessary to realize the benefits of research findings . . . . . Modern learning research is producing very little impact on educational technology or training practice.

3. *Using Knowledge in Attacking Major Contemporary Problems*—the points emphasized include:

(a) The solution should be sought within the context of the problem, rather than hoping that knowledge developed in basic research or in other applied areas will have great application to the particular problem needing solution.

(b) The solution to contemporary social problems will be complex and many faceted.

(c) Certain critical conditions are essential for the successful attack on any major problem: (1) Appropriate acceptance and motivation on the part of the community, the government, and other involved agencies in recognizing the need for a concentrated effort toward problem solution must be evidenced; (2) there must be a trained, motivated, and experienced staff available for long-term application to the problem; and (3) funding must be made available.

(d) The concept of assessment is fundamental to solving significant problems.

(e) A new profession of social or educational engineering needs to be developed. There should be a middleman's role between the researcher and practitioner, devoted to solving specific problems.

(f) Simple solutions and instant experts are counterproductive.

(g) A special problem exists because of the nature of the gatekeeper in contemporary problem areas. Often it is unclear exactly what body is responsible for making a given decision. Too frequently the gatekeeper in education and social areas holds his position due to political abilities rather than trained professional expertise.

49

CHANGE THROUGH GROUPS
Change in attitudes
Group dynamics

ANALYSIS AND SUGGESTIONS

Cartwright, Dorwin. Achieving change in people. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 698-710.

Purpose

Since the behavior, attitudes, beliefs, and values of the individual are all firmly grounded in the groups to which he belongs, the author focuses on the group as a medium for achieving change in individuals, showing how efforts to change behavior can be supported or blocked by group pressures.

Method

The principles set forth by the author are drawn from research in group dynamics.

Findings and Conclusions

In the following set of principles Cartwright suggests ways in which constructive use can be made of group pressures.

1. If the group is to be used effectively as a medium of change, those people who are to be changed and those who are to exert influence for change must have a strong sense of belonging to the same group.
2. The more attractive the group to its members the greater is the influence that group can exert on its members.
3. In attempts to change attitudes, values, or behavior the more relevant they are to the basis of attraction to the group, the greater the influence that the group can exert upon them.
4. The greater the prestige of a group member in the eyes of the other members, the greater influence he can exert.
5. Efforts to change individuals or subparts of a group which, if successful, would have the result of making them deviate from the norms of the group will encounter strong resistance.
6. Strong pressure for changes in the group can be established by creating a shared perception by members of the need for change, thus making the source of pressure for change lie within the group.
7. Information relating to the need for change, plans for change, and consequences of change must be shared by all relevant people in the group.
8. Changes in one part of a group produce strain in other related parts that can be reduced only by eliminating the change or by bringing about readjustments in the related parts.

50

INNOVATION: EDUCATIONAL
Innovation correlates
Innovation measures

EMPIRICAL STUDY

Cawelti, Gordon. Innovative practices in high schools: Who does what—and why—and how. *Nations Schools,* 1967, 79, 56-88.

Purpose

This study was undertaken to determine the adoption status of 27 important educational innovations. The author attempts to highlight the differences between innovative and noninnovative schools. Finally he gives the reader some insight into how to go about change by having some of the

more innovative schools surveyed relate their experience and advice.

Method

This was a nationwide survey of accredited high schools; 7,237 schools contributed response.

Findings and Conclusions

1. The major findings of the study were:

(a) The typical high school reporting in the survey used only six of the 27 innovations listed.

(b) The most innovative schools were the large public suburban high schools spending more than $650 per pupil.

(c) Schools with larger enrollments tend to have more innovations.

(d) The diffusion rate for acceptance of new ideas is more rapid than previously, but still slow.

(e) Schools and states vary greatly in their innovative rates, with Connecticut, New York, and Rhode Island being the most innovative states and Arkansas, Louisiana, and South Dakota being the most laggardly. *Cost appears to be a retarding factor* in many cases. However, the study also indicates that certain kinds of administrators seem to facilitate innovation, producing change even when funds are limited.

(f) There is still relatively little known about the effects of these different innovations on learning over a meaningful period.

(g) The high-abandonment rate for some innovations, such as certain new science and math curriculums, television, programmed instruction, and team teaching stresses the need for careful planning before adoption and careful attention during the early years.

(h) The haphazard approach to innovation indicated in the responses to the survey, suggest that "Continued and intensified efforts from school administrators will be needed to clarify the change process and to subject new ideas to better scrutiny on a large-scale basis. Schools must develop discrete goals, a system for continuous evaluation, and a willingness to acknowledge weaknesses in planning for change."

2. The author asked several of the most innovative high schools to outline their strategies for innovations and change. Two of these seem particularly relevant.

(a) *School No. 1's advice on change*—change is a process that takes time. The school offering these suggestions followed a 3-year plan for change. In the first year the necessary structures were changed to accommodate the innovation. The second year was devoted to changing the people involved, primarily through in-service staff training. The third year focused on changing the curriculum and learning materials.

(1) The factors that were felt to be instrumental in making the change effective include: (a) Give the teachers plenty of latitude in proposing alternatives. (b) Stress the advantages of the innovation.(c) Encourage interaction and open exchange of differences on change proposals. (d) Use feedback from teachers and students to locate and correct problems. (e) Hold frequent meetings with teachers and administrators in both large and small groups to discuss problems related to the innovations. (f) Exert intensive efforts to secure financial support for the innovations.

(2) This school found the following to be persistent and pervasive problems related to innovativeness: (a) Being innovative is taxing and tiring—everyone has to work harder. (b) Teacher morale needs support. They often express feelings that there is too much work, too much change, and too much pressure. (c) The innovative school is always in the spotlight. Defenders of the status quo are quick to attack. (d) Innovative schools tend to overlook mechanics of efficient administration.

(3) The following advice is given by the school administrators of school No. 1: (a) Be prepared to carry out your own in-service program. Use faculty meetings to help teachers. Help is most effective, as is change, when teachers feel the need for it. (b) Develop a systematic plan for change. Have a clear idea where you're going and how to get there by clearly defined steps. (c) Run an open school. Invite parents, the press, community leaders. Their observations are the best answer to their skepticism. (d) Share the wealth. Find ways for teachers to share in benefits of innovation, see that they have appropriate tools, support with praise,

see they have time for developmental work. (e) Change is most successful when it develops from a base of stability. Be ready for problems—and don't panic when they come.

(b) *School No. 2's advice on change*—these suggestions are directed toward overcoming the rough spots in the change process.

(1) Don't be a plunger. Make changes gradually. Move only as far and as rapidly as your faculty commitment and facilities will allow. It's not necessary for all of the staff to agree to or be ready for change, but you must have a clear conception of what it is you're trying to do, how you're going to do it, and what the ground rules are.

(2) Prepare a position statement setting down the guidelines. Let the staff write it together; involve as many as possible.

(3) Build a program that fits needs and goals, drawing upon other experiences and designs.

(4) Encourage teachers to visit schools that use innovative approaches.

(5) Make sure you are adequately staffed to provide teachers with the individual counseling and support needed during the change.

(6) Get firm support for the entire program from the board of education. Enlist cooperation and support from all departments.

51

RESEARCH-PRACTITIONER COLLABORATION

Practitioner attitudes
Consultant role

CASE STUDY

Chesler, M., and Flanders, M. Resistance to research and research utilization: The death and life of a feedback attempt. *Journal of Applied Behavioral Science*, 1967, 3, 469-487.

Purpose

This article is an account of two meetings at which researchers in a school system reported back to school principals about their findings. At the first meeting the researchers were greeted with distrust and skepticism, but the principals asked for additional information which had not been included in the first analysis. The researchers complied and found that in the second meeting they were able to achieve a collaborative relation with the principals.

Method

The article analyzed the forces operative in the two meetings and concluded with a summary of the "rules of the game" for such planned interventions.

Findings and Conclusions

1. The research was concerned with teacher attitudes and feelings and the ways in which teachers shared information about teaching practices. At the first meeting some principals were wary of the feedback, fearing it might reflect negatively on their own performance; they distrusted the researchers and the validity of their data; and they expected clear dicta about how schools should be run to emerge from the research. When the researchers declined to give dogmatic interpretations of their findings, the principals asked for more comparative data about the various schools, which the researchers agreed to give.

2. Luckily this beginning of collaboration, combined with some guilt over the hostility which the principals had shown at the first meeting, the superintendent's support of the project, and the completely voluntary nature of the project participation, enabled the principals to approach the second meeting with open minds.

3. At the second meeting the researchers stepped off their pedestals, admitted their mistakes and their ignorances, and allowed the principals to

share in the planning for how the reporting back should be done. The principals responded with greater cordiality and interest and used the data to extract what would be relevant to them and to help in its interpretation.

4. The "rules of the game" which the authors give apply not only to feedback attempts but to the whole process of research in an applied setting. They suggest four steps:

(a) Client preparation and contract formation in which the scientist explains what he wants to do and gains client agreement, exchanges expectations and concerns with the client, and both give up the expectation that dogma will emerge from the study.
(b) Establishment of trust in which the scientist explains his own values and his acceptance of the client's, is candid about his personal and professional limitations, demonstrates flexibility in adapting to client needs, and demonstrates that the practitioner can feel safe in dealing with sensitive issues.
(c) Demonstration of valued resources in which the scientist presents observations tied to relevant practitioner criteria, in such a way that the practitioner can act upon them with the skilled help of the scientist.
(d) Facilitation of autonomy in which the scientist promotes collaboration rather than dependency and gives the client the encouragement and skills to proceed further on his own.

52

ORGANIZATIONAL CLIMATE: EDUCATION

Innovation
Interpersonal relations

REVIEW OF LITERATURE

Chesler, M. A., and Fox, R. Teacher peer relations and educational change. *National Educational Association Journal*, 1967, 56(5), 25-26.

Purpose

The authors explore and stress the importance of interpersonal relationships within the school as factors in the change process. They feel that the roles of the individual teacher and the faculty peer group in initiating and maintaining the change process have been largely neglected in studies of planned change.

Method

Convinced that good relationships between the peer group as a whole and the rest of the school structure are essential elements of a healthy climate for change the authors support their contention by reviewing the research completed in this area.

Findings and Conclusions

The generalizations drawn from this research review include:

1. The opportunity for formal and informal associations with colleagues encourages teachers to share their ideas about change. Teachers who serve on committees together or who travel to school together are more likely to know and support each others' innovations than teachers who do not have this kind of association with their fellow workers.

2. Sometimes the faculty is so organized that it blocks the sharing and dissemination of new ideas. New teachers in a system, fresh from college or advanced training, may enter a school eager to try new ways only to be blocked by an established culture dominated by older teachers who do not welcome the suggestions of new recruits. Similarly, negative evaluations and lack of support from colleagues may hinder any teacher from trying out or continuing personal experiments.

3. When teachers as a group feel powerless, isolated, uninvolved, and dissatisfied with their roles, they are not likely to instigate change.

4. Data indicate that teachers need to feel involved and potent in their organization in order to

support educational change. They must know that they have the backing of their fellow teachers and their administrators before they are willing to try new ideas.

5. The authors feel that in order to establish a healthy climate for change we first need to develop ways for individual teachers to share new ideas with other staff members and to gain support for worthy innovations. Further, by adopting new administrative styles which decentralize decision making, teachers can be involved in developing innovations and change.

6. In-service programs that go beyond the traditional college extension courses to workshops or laboratories which help teachers perfect problem-solving skills and explore their interpersonal processes are particularly effective means of creating climates for change. Such sessions may focus on openness of communication, emphasize sensitivity to interpersonal relations factors, and analyze the field of forces affecting efforts to change.

53

CHANGE PROCESSES
Change agent
Change models

ANALYTICAL MODEL

Chin, Robert. The utility of systems models and developmental models for practitioners. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 297-312.

Purpose

The purpose of the paper is to present concepts relative to, and benefits to be gained from, using a "system" model and a "developmental" model in thinking about change phenomena.

Method

Based on wide reading, the author presents the rudiments of the system and developmental models, and attempts an integrated adaptation of the system model in what he calls the "intersystem" model.

Findings

1. Major concepts or terms of the system model are defined, including: system; boundary; tension, stress, strain, and conflict; equilibrium and "the steady state"; feedback; and open and closed systems.

2. The major terms of the developmental model are also defined: direction; identifiable state; form of progression; forces; and potentiality.

3. The "intersystem model" involves two open systems connected with each other with the aid of a change agent. (In a sense, this could be represented by subsystems of a larger system.) However, the change agent, whether external or part of the client system, must remain separate from the two major systems involved, and is, in a way, an independent system.

4. Each of the models is examined with regard to the following five questions:

(a) Does the model account for stability and change? (Content)
(b) Where does the model locate the source of change? (Causation)
(c) What does the model assume about the determination of goals and directions? (Goals)
(d) Does the model provide levers for effecting change? (Intervention)
(e) How does the model place the change agent in the scheme of things? (Change agent)

5. With their limitations, the several models are regarded as helping the change agent to organize his thinking about a given situation.

54

CHANGE STRATEGIES
Change taxonomy
Planned change

ANALYSIS

Chin, R., and Benne, K. D. General strategies for effecting change in human systems. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 32-59.

Purpose

The article presents general strategies and procedures for effecting change with particular reference to conscious, deliberate, and intended efforts.

Method

The authors classify change strategies under three headings: (a) empirical-rational, (b) normative-reeducative, and (c) power-coercive. The philosophical bases for and the functional manifestations of each of these modes are presented.

Findings and Conclusions

1. *Empirical-rational strategies* are based on the assumption of the rational man who changes his behavior on the basis of proper information and knowledge in response to environmental stimuli. These strategies include basic research and dissemination through education; proper personnel selection, assessment, and replacement as the key to carrying out educational and other enterprises; systems analysis; applied research and linkage systems for diffusion of research results; utopian thinking as a method of forecasting problems; and perceptual and conceptual reorganization through clarification of language.

2. *Normative-educative strategies* are based on the view of man's transactional relationship to the environment. Intelligence is developed socially, not individually. Change is brought about by developing a system's capacity for problem solving by (a) scanning for the detection of problems, diagnosing problems to determine relevant changeable factors, and encouraging collaborative efforts among parts of the system; and (b) fostering growth and development in people who make up the system to be changed.

3. *Power-coercive strategies* view power as an ingredient of all human action and seek to mass economic and political power behind given objectives by the use of nonviolent tactics, employment of political institutions, and recomposition and manipulation of power elites.

4. Methods of implementing the several strategies are presented, as are the relationships among the strategic types.

55

RESEARCH UTILIZATION: EDUCATION

Government intervention
Extension service

ANALYSIS AND SUGGESTIONS

Clark, David L. The function of the U.S. Office of Education and the State departments of education in the dissemination and implementation of educational research. In K. Goldhammer and S. Elam (Eds.), *Dissemination and implementation: Third annual Phi Delta Kappa symposium on educational research.* Bloomington, Ind.: Phi Delta Kappa, 1962, pp. 105-127.

Purpose

In this paper, the author advocates an extension service role for the Federal and State Government in order to insure the necessary changes in our educational programs and systems.

Method

The ideas in this paper are based upon the insights and observations of the author.

Findings and Conclusions

1. Clark compares the diffusion of innovations and information in agriculture with that in education, pointing out that the methods utilized by agricultural departments are clearly more efficient.

(a) Years ago, in agriculture, the primary vehicle of communication from the researcher to the practitioner was the printed word, and the impact was slight. Education today is still too reliant on the printed word as the main communication channel.

(b) In agriculture two levels were interposed between the researcher and the practitioner: (1) The extension specialist who read and translated research for, and (2) the county agent who in turn made it possible for the farmers to understand its significance for them. The county agent was encouraged to make use of demonstration projects to drive home his points.

2. The author advocates an extension service in education using Federal funds to establish cooperative programs which could result in a nationwide network of experimentation and demonstration centers employing the best that is known about the ways in which change in practice can be effected. "The total cost of such an educational extension service would not be great. If one-half of 1 percent of the total cost of education were devoted to this effort, and much of the expense would be met by redeploying existing resources, the extension service could be initiated and moved ahead at a rapid rate."

3. The extension service is only one way of taking into account the passive or slightly resistant role of many practitioners.

56

INNOVATION REJECTION

Innovation: hospital
Practitioner attitudes

CASE STUDY

Coe, R. M., and Bernhill, E. A. Social dimensions of failure in innovation. *Human Organization*, 1967, 26, 149-156.

Purpose

The authors analyze the adoption and eventual rejection of a technological innovation in a community general hospital in order to gain some insights into a system's rejection of a technically

sound and successful innovation. They attempt to explain some of the reasons for the failure of a planned change.

Method

This study was a before-after longitudinal investigation of the accompanying changes in the attitudes and practices of nursing personnel when a new system of processing medications was introduced at a community general hospital. When the before data were collected none of the nursing personnel nor medical staff had any knowledge that such a change was being planned. On a standardized questionnaire, respondents were asked to evaluate four aspects of the traditional system using a five-point scale, and to answer an open-ended question concerning perceived problems with the present situation. Basically, the same questionnaire was used in the two data collections that followed the innovation introduction.

The two-phase design for the collection of post-data ascertained information just after the initiation and after an interval of time necessary for it to become routinized. All nurses and visiting and house staff doctors associated with the adoption units were asked to submit questionnaires.

The attitudes of the nursing personnel toward the old system were compared with those of the physicians while it was still in use. The changes in responses from time 1 to time 3, that is, the shifts in attitudes over time after the introduction of the new system, were also analyzed.

Findings and Conclusions

1. The baseline data indicated that most personnel were relatively satisfied with the then-existing medications system. (This suggests that one of the elements necessary for successful adoption of an innovation—a perceived need for the change—was missing.)

2. The authors expected that with the passage of time, the positive ratings for the innovation would increase as the resistance to the innovation declined. This did not, however, occur. When the new medication system was introduced, it was initially judged to be better than the old system in two areas: ordering and procuring medications. The innovation was judged less effective than the old system in two related areas: distribution and patient safety. The initial preference, eight months later, for the ordering and procuring aspects of the new system had declined significantly, while there was a less noticeable decline in the other two areas.

3. Despite the technical success of the new system, it ultimately failed. Within a few months of installation the system virtually reverted to the process it used some three and one-half years earlier. The authors offer several suggestions on why the innovation failed, and why the predicted pattern or response was not found for certain aspects of the innovation.

4. The authors noted several reasons for the innovation rejection; lack of perceived need for change; inability of the new system to meet personnel expectations; and hostile attitudes toward the change agents. The following discussion points are raised in an attempt to explain the adoption rejection process that occurred.

(a) *The halo effect*—much of the initial approval of the system as a whole may have been due to the favorable response to one aspect of the system, procuring. The fact that the new system was not rejected outright may have been partly because of the favorable response to this aspect of it.

(b) *The loss of authority*—the fact that this innovation disrupted the social organization of the nursing unit and resulted in some loss of authority for the head nurse may be another explanation for its failure. The authors note that in a separate study of the nurses, the head nurses were found to be more change resistant than other nurse respondents.

(c) *The false positive*—the authors suggest that the nurses may have answered the questions the way they thought the interviewers would want, thereby creating a false positive. Members of the planning group were still in direct relations with the nursing personnel at the collecting of time 2 data. The fact that the ratings at time 3 declined after eight months might reflect that the nurses no longer felt compelled to answer positively.

57

RESEARCH-PRACTITIONER GAP
Resistance to research utilization

ANALYSIS

Cohen, Julius. Factor of resistance to the resources of the behavioral sciences. *Journal of Legal Education*, 1959, 12, 67-70.

Purpose

The author identifies and briefly discusses three sources of resistance to behavioral science research that are common to practitioners in most fields.

Method

The author has based his analysis on his own knowledge, experiences, and observations.

Findings and Conclusions

The three identified sources of resistance in practitioners are:

1. The resources of the behavioral sciences have not been aimed to answer specific and practical problems. The concreteness required by practitioners is often viewed as trivial by researchers.

2. A feeling that behavioral science resources have yielded findings that are much too unripe and too tentative for reliable use in predicting human behavior.

3. A fear of inability to cope with the enormous task of mastering these resources and shaping them to his own needs.

58

INNOVATION: MEDICAL
Innovation correlates
Diffusion process

EMPIRICAL STUDY

Coleman, J. S., Katz, E., and Menzel, H. *Medical innovation: A diffusion study.* New York: Bobbs-Merrill, 1966.

Purpose

This book reports the introduction of a new drug, and its acceptance, through time, among prescribing physicians.

Method

Most studies of this kind of process are totally dependent on subjective recollection of adoption. This study is based on actual data (prescriptions written by the physicians during the 16 months following the introduction of the drug) and the determination of the effective social networks operative in terms of friendship, as well as professional patterns of advice, consultation, and discussion.

Findings and Conclusions

1. While several channels of influence usually preceded introduction of the new drug, a social intermediary (detail man or colleauge) rather than impersonal media (journals, house organs, etc.) was most frequently indicated as the major source of influence.

2. The greater the involvement of the physician in the medical community, the more personal and professional ties he had in the complex network, and the more deeply integrated he was in his local medical community, the greater the likelihood of early adoption of the new drug.

3. There were two distinct patterns of diffusion: (a) cumulative adoption by the physicians well

integrated in the medical community resembled the contagion process; (b) the constant rate of adoption among those physicians less integrated into the medical community was typical of individual isolated patterns.

4. The "contagion" pattern of adoption varied with the nature of the social interaction. Professional interaction tended to produce similarity of adoption behavior more quickly than did friendship. The analysis of friendship interaction patterns, however, produced greater similarity of adoption behavior than random pairing of physicians in the community.

5. In prescribing new drugs, the doctor must cope with the attitudes of the patient (as is the case with many individuals working in related health fields).

6. There is too much information, often spelled out in too highly specialized idiom for practitioners who are busy practicing to have time to assimilate it.

7. Innovators who first used the drug seemed to be conservative in the degree of prescription, while those who were conservative in time of first use appear bolder in their degree of prescription.

8. Innovators tended to be specialists rather than general practitioners. They were not old, but just as likely to be middle aged as young.

9. The early users, including innovators, were more likely to visit out-of-town medical institutions than the later users. Innovators could more often name an institution outside their community that they looked to as a source of medical knowledge than later users.

10. Innovators also typically had a greater number of different institutions included within their horizon, either as places of past training or as part of their current attention span than later users.

11. Early users frequently attended meetings of specialty societies but not general medical conventions.

12. Early users were more likely to subscribe to a large number of medical journals than later users.

13. The innovator was more likely to be highly interested in medicine as a science, and more likely to orient his work to others within the profession than to his patients or other nonmedical people than later adopters.

14. The innovator was also more likely to select colleagues as social companions than was the noninnovator.

15. Sources of information were as follows: 57 percent of the doctors said they first learned of the drug from the detail man, 18 percent learned from direct mail from drug houses, 7 percent named a professional journal, 7 percent another physician.

16. Almost 90 percent of the doctors sought or awaited word from at least one other source before first use, 62 percent indicated three or more sources of confirmation.

17. Two communication channels were used by most physicians before adoption. Information was most effectively carried through commercial channels; validation was most effectively created through professional channels and colleagues.

18. Most doctors went through the same sequence of channels of influence, but at differing rates of speed.

59

UTILIZATION CONFERENCE
Research utilization: rehabilitation
Conference evaluation

CASE STUDY

Cooper, C. R., and Archambault, B. (Eds.) *Communication, dissemination, and utilization of research information in rehabilitation counseling.* Proceedings of a regional conference sponsored by the Department of Guidance and Psychological Services. Springfield, Mass.: Springfield College, 1968. (In collaboration with Rehabilitation Service Administration, Department of Health, Education, and Welfare. Research grant No. RD-2310 G.)

Purpose

The purpose of the conference was to stimulate the interest of vocational rehabilitation administrators and practitioners in the communication, dissemination, and utilization of research results.

This regional conference followed a conference in 1966 held by the Joint Liaison Committee of the

Council of State Administrators of Vocational Rehabilitation and the Rehabilitation Counselor Educators on the same subject, at which it was suggested that the problems associated with the utilization of research results be studied at regional conferences.

Method

The design of the conference incorporated several considerations aimed at maximizing the meaningfulness of the experience for participants and securing long-range results from the effort. The proceedings serve as a case study of this effort.

Findings and Conclusions

1. Holding the conference in two parts, each consisting of two days, and separated from one another by a period of three to four months, provides a more meaningful experience for participants than holding a conference for four consecutive days.

2. Providing the participants with an opportunity to determine the program for the second part of the conference increased their involvement with the issues being considered.

3. Providing the participants with research materials between the first and the second parts of the conference, relevant to topics in which they had expressed an interest, facilitated the acquisition and reading of research by the participants, and increased their receptiveness to such materials after the conference.

4. Individuals are more stimulated to seek out and to read research reports if their participation at a conference results in their developing guidelines to promote the use of such materials by themselves and by their colleagues in their respective settings than if they are provided with a relatively passive experience.

5. Two assumptions were made in the selection of participants which the authors felt paid off:

(a) It was felt that the individuals invited should be persons who had established a fairly effective and extensive horizontal and vertical communication network within their respective settings. That is, participants should be opinion leaders.

(b) It was felt that individuals enrolled in graduate programs in rehabilitation counseling should be included as participants, as well as individuals employed on the counseling staffs of various State or Federal rehabilitation agencies.

6. A postconference follow-up which was conducted two months after the second part of the conference indicated that participants were favorably influenced by the conference, specifically in terms of more interest in and more reading of research materials. Two State agencies reported projects that they had initiated or hoped to initiate as a result of the conference:

(a) One agency started a program wherein staff members are regularly selected to present research in meetings of agency staff twice a month. Specific research is alternatively assigned, chosen, or selected independently by the presenting person. A fourth part consists of communicating selected experiences to the rest of the staff, and describing how various presentations and/or psychological positions relate to those experiences.

(b) Another agency has established a team of interested counselors which is to review certain journals, etc., for research relevant to the work of the agency. The more interesting items will be listed by summary and source in a listing made up every two months. In addition, the team plans to list at least two research findings in summary form. A smaller group will work with the district supervisor to see what ideas might be implemented.

60

INNOVATION: EDUCATION
Change strategies
Organizational factors

EMPIRICAL STUDY

Corwin, R. G. Strategies for organizational innovation: An empirical comparison. *American Sociological Review*, 1972, 37, 441-454.

Purpose

1. To outline aspects of social intervention strategies which the sociological literature suggests will be conducive to change. Corwin cites classic works in organizational sociology and postulates that certain characteristics of both individuals and organizations will be associated with change.

2. To determine whether postulated characteristics are, in fact, associated with change. Researchers studied ten Teacher Corps programs in urban and rural areas in every region in the United States.

3. To discuss the findings and suggest improvements in research methodology.

Method

The Teacher Corps program was a national experiment to train teachers and improve the quality of education in low-income schools. Ten universities with Teacher Corps programs and forty-two cooperating schools were visited for one week by teams of interviewers during the fall and winter of 1968-1969. Questionnaires were also administered.

The dependent variable is the number (and innovativeness) of new technologies introduced into schools through the program. Thirty-five indicators were factor analyzed, revealing seven factors associated with change, though regression analysis indicates that only half of the variance in the dependent variable is explained.

Findings and Conclusions

1. The literature of sociology and human relations suggests some critical concepts and types of variables which might help identify effective intervention strategies. The author postulates that an organization can be more easily changed:

(a) if it is invaded by liberal, creative, and unconventional outsiders with fresh perspectives;
(b) if these outsiders are exposed to creative, competent, flexible socialization agents;
(c) if it is staffed by young, flexible, supportive, and competent boundary personnel, or "gatekeepers";
(d) if it is structurally complex and decentralized;
(e) if it has the outside funds to provide the "organizational slack" necessary to lessen the cost of innovation;
(f) if its members have positions that are sufficiently secure and protected from the status risks involved in change;
(g) if it is located in a changing, modern, urbanized setting where it is in close cooperation with other organizations that can supplement its skills and resources.

2. In the Teachers Corps programs studies, seven factors resulted from the factor analysis of the 35 indicators. These seven accounted for only 51 percent of the total variance. Of the seven, three accounted for 48 percent of the total variance.

Thus, technological innovation appeared to be produced by a combination of: (a) a dominant outside organization staffed by competent and liberal members; (b) competent, receptive boundary personnel in the host organization; and (c) functional interdependence and channels for cooperation to take place.

3. The author is cautious in generalizing from the findings but tentatively offers these conclusions:

(a) The way an innovation is conceived and implemented is a product of a combination of forces inside and outside the organization.
(b) Characteristics of both occupation and organization must be taken into account in order to explain innovation.
(c) A split develops between the established leaders of a profession and a new generation.

In view of the small variance explained by the factors in this research, the author recommends a

combination of several conceptual approaches to the study of technological innovation. Corwin notes: "It appears that there is a great deal of both truth and fiction in the various streams of thought which served as the original guidelines. The various types of variables seem to supplement one another."

61

ORGANIZATIONAL CLIMATE
Change taxonomy
Change process: government

ANALYSIS

Costello, Timothy W. Change in municipal government: A view from inside. Paper presented at the meeting of the American Psychological Association, San Francisco, Calif., September 1968.

Purpose

This paper analyzes the mechanism of change within the context of a political setting. The author prepared the material from his vantage point as deputy mayor-city administrator, New York City.

Method

The concepts are formulated partially on the basis of the literature but principally on the basis of Dr. Costello's personal involvement in municipal government.

Findings and Conclusions

1. Organizational change is classified as either input or output. Examples of input: changes in leadership, in structure, in process (technical and social), in resources (fiscal, human, physical). Examples of output: changed goals, greater effectiveness in achieving goals, more efficiency, better morale, changed relationships with the market (or, in the case of a governmental unit, the service base).

2. There are significant management differences between the public and private sectors which are relevant to the subject of change.

(a) Periodic changes in top leadership are more drastic and far-reaching in the public sector than the private. (Sometimes this accelerates change, sometimes it delays it.)

(b) The products of public agencies (services) are more difficult to quantify than the products of private enterprise.

(c) The constituency of a government agency is extremely heterogeneous; this tends to delay the change process and dilute change decisions into compromise.

(d) Change in the public sector has higher visibility (hence it is riskier) than in the private sector.

(e) Public agencies have less freedom to make their own decisions than do private organizations.

(f) Because of the political realities, changes in public organizations tend to be those with immediate and politically visible effects; these tend to be relatively superficial changes.

(g) Within a government unit, vested interests quickly build up around existing programs and thus the range of change decisions is narrowed.

3. The following types of changes are cited by the author:

(a) *Planned changes*—exemplified in reorganization of governmental structure.

(b) *A confluence of force*—the school decentralization in New York City.

(c) *Event-dominated change*—the changes in the city's relationship to its employees that emerged from the New York sanitation strike.

(d) *Accidental innovation*—the fortuitous modification of an air pollution control law.

(e) *External intervention*—Federal law and Federal money (as in the model cities program).

62

ORGANIZATIONAL CHANGE
Change in attitudes
Change agent: administrator

ANALYSIS

Costello, T. W., and Zalkind, S. S. (Eds.) *Psychology in administration.* Englewood Cliffs, N.J.: Prentice-Hall, 1963.

Purpose

This book presents an application of psychological theory and principles to the business administration setting and the problem of understanding and facilitating organizational change. Only those parts of the book dealing with change are summarized.

Method

The concepts in this text are based on a review of research from various subfields of psychology.

Findings and Conclusions

1. The following forces operate against a ready response of an organization to the need for changes:

(a) Those in the organization who are high enough to initiate change are the ones who have benefited most from the extant order; thus they may be reluctant to change what has worked well for them.

(b) The group in charge is likely to be an older group with firmly established ways of thinking and doing business.

(c) In the change process, the hazards may appear early, the rewards late, perhaps even after the men at the top of the hierarchy are gone.

(d) Those men immediately below the top may oppose change. If they do, they may distort data reaching the top. Their resistance may stem from these reasons:

(1) They may identify with a particular function rather than with the organization as a whole.

(2) Their role and status relationships in the group may be carefully worked out and they may be threatened by possible disruption.

(3) The change might eliminate systems they have established.

2. In business organizations there might be readier response to the need for change if older managers were eased into consultative roles and younger managers given increased responsibility for decision making; if creative staff were given the sole job of developing innovative plans and if high need achievement were used as a basis for selecting entrepreneurs.

3. In considering whether to change, three interacting and interdependent forms of change must be analyzed: (a) The decision to change can set new overall organizational objectives; (b) the decision to change can prescribe changes in the organization itself, in its size, its structure, or its processes; (c) the change decision may involve changing significant personnel.

4. *The Administrator as a Reinforcement Agent* —in his role as a change agent, the administrator is a manager of reinforcement. He must place emphasis on intrinsic reinforcements such as salary and fringe benefits.

(a) Positive reinforcement of correct responses is essential. Not only must the reinforcement be appropriate, but the timing and the scheduling of reinforcement is critical. A variable reinforcement schedule related to a man's activity rather than to the calendar would seem appropriate. Reinforcement should be seen as linked to desired performance of change.

(b) Punishment, per se, will not work in effecting change. It has the following possible effects: (1) increasing the occurrence of undesired behavior, (2) causing undesired behavior to last longer, (3) having a short-lived deterrent effect, (4) causing the individual to vary his behavior but not to control the direction of the variability, (5) arousing negative feelings that lead to less desired behavior, and (6) possibly improving behavior by providing negative feedback.

5. The following factors facilitate learning:

(a) *Knowledge of results.*

(b) *Motivation*—the intention to learn.
(c) *Set*—a specific set as to what is to be learned that will aid learning.
(d) *Attitudes*—material consistent with one's attitudes will be learned more readily.
(e) *Transfer of training*—new procedures, etc., will be learned more readily if they have similar components to already learned techniques.
(f) *Repetition with reinforcement.*
(g) *Distributed practice* will help in learning complex tasks after an initial period of mass practice.
(h) *Active practice*—learning by doing is an often violated principle. Active involvement is always to be preferred to passive listening or watching.
(i) *Organization*—the better organized the material, the more meaningful it is, the more quickly it will be learned.

6. Two factors related to attitudes causing resistance to change which must be dealt with if change is to be successful are: (a) Training for change disrupts the regular work of the individual and may cause him to fall behind and to lose the satisfaction of getting the job done; and (b) change may be seen as a move to a more efficient, less personal activity that will disrupt the social adjustment the individual has made.

7. In considering attitude change, the basic premise is: for attitude change to occur, need to change must be aroused. This premise can be applied as follows:

(a) *Adjustive or utilitarian attitudes*—the administrator must lead the subordinate into dissatisfaction with the subordinate's own current attitude. His attitudes begin to shift only if alternative attitudes can be seen by him as moving toward an objective that he accepts.
(b) *Ego-defensive attitudes*—these are the more difficult attitudes to change. Giving new information and threatening may only stiffen resistance. With these attitudes the administrator must recognize the time-honored concept of face-saving. The employee must not feel that an attempt to change his attitude is a personal attack on him. Emotional catharsis or letting off steam, permissive group meetings, or letting people air their objections, etc., may help in overcoming resistance based on ego-defensiveness.
(c) *Value-expressive attitudes*—these might most appropriately be aroused by the administrator. Doing the best job possible might become a superordinate goal.
(d) *Knowledge-serving attitudes*—if there is an ambiguous situation, the need for knowledge may help change attitudes. Under these conditions, providing information will be helpful.

8. There are various conditions facilitating attitude change:

(a) Role playing, or the actual provision of a new role for an individual which he chooses to accept may effectively change attitudes.
(b) Interpersonal pressure is the time-honored approach of getting a person into a situation where others can influence him. This has experimental evidence as well as tradition to support it.
(c) There is much evidence suggesting that behavior required of an individual can be a prelude to attitude change. The common view that we cannot legislate attitudes is both incomplete and incorrect.
(d) Information, particularly information that is credible, that is relevant to an individual's needs, that comes from a high-status person, to people who are willing to expose themselves to the information, may help in changing attitudes.
(e) Situational changes, such as in record keeping, may help effect a change.
(f) Participation often operates to influence behavior as well as attitudes.

9. In summarizing research on dissonance theory, the following guidelines for administrators emerged:

(a) The administrator should recognize different functions or attitudes and know that an individual must feel a need to change.
(b) The need to change must be aroused. Other needs, irrelevant, are often induced by special reward systems.
(c) Values important to the person should be aroused.
(d) Feelings of threat should not be aroused.
(e) Individuals or groups should be given a special role leading to behavior arousing feelings of dissonance and leading to attitude change.
(f) The groups should be used as a source of support for attitude change.
(g) An expression of commitment to change behavior should be made. The person should make some effort.

(h) The feeling of choice for the individual should be maximized.
(i) The useful limits of information should be recognized.
(j) Don't be surprised by individual differences.
(k) Don't be surprised if after all this, attitudes still don't change much.

10. There are three main organized attitude change procedures used in industry: (a) management development, (b) human relations programs, and (c) participation methods. A favorable attitude toward one's administrative responsibilities is a necessary prerequisite for management development. The emphasis on the validity of human relations training is problematic. The feedback system, based on orderly collection of information, feeding it back to the system using it in making adjustments may be more effective. With participative methods, it is important that the individual come to a decision, even if it is not publicly stated.

11. In problem solving, which is often an essential part of change, the aspects in the environment relevant to success are:

(a) Access to necessary information.
(b) Time free from the pressures of routine.
(c) A system of rewards or sanctions that motivate problem-solving efforts.
(d) Stimulation from interaction with other professions.
(e) An atmosphere free from rigidity or threat.

12. Since many people prefer routine over problem-solving activity, perhaps special problem-solving activities should be assigned.

13. Two main barriers to effective problem solving are the wrong set and inadequate or improperly used information. In training or preparing people for problem solving, there are four stages:

(a) Increasing trainee's technical competence.
(b) Providing orientation and processes of problem solving.
(c) Providing practice.
(d) Maintaining a training attitude, an evaluative attitude toward subsequent experiences.

14. In a concluding statement on the problem-solving characteristic of an organization it is said, "The point for us to consider is that an organization's problem-solving system is more likely to be geared for past problems than for current or future ones. The challenge is to examine and modify conceptual schema, types of information available, and assignments made in the light of current and future conditions in order to minimize any dysfunctional carryover from the organization's past."

63

RESEARCH COMMUNICATION
Knowledge dissemination: science
Communication media

REVIEW OF LITERATURE

Crane, D. The nature of scientific communication and influence. *International Social Science Journal,* 1970, 1, 28-41.

Purpose

The author discusses three aspects of scientific communication: (1) The structure of formal communication in science; (2) formal and informal sources of scientific information, and the kinds of information each channel brings; and (3) the structure of social relationships in research areas.

Method

Review of the literature, supplemented by the results of the author's own studies of social organization among scientists and its effect on communication and influence in the specific areas of rural sociology and mathematics.

Findings and Conclusions

1. *The Structure of Formal Communication in Science*—most articles concentrate on a few items, coupled with a broad scattering of interest beyond these specialized limits. Any problem area in the literature has many ties with its nearest neighbors and a few ties with more distant neighbors. The

scientific literature consists of tightly knit cores, each of which is loosely linked to a large number of other cores. According to the author, the question arises whether this same pattern can be seen in the social structure of science.

2. *Formal and Informal Sources of Information*—scientists obtain the information they need from journals and from informal communication with colleagues via verbal reports, correspondence, and conversation. Their use of formal or informal channels depends on whether they are searching for knowledge in their specialized area or outside it. A scientist explores tightly knit cores of knowledge through directive searching for specialized, specific information. Links to other cores result from random searching, which reveals unanticipated foci of relevance beyond the core. This searching might be less unpredictable if the social ties that link areas of knowledge were better understood.

3. *The Structure of Social Relationships in Research Areas*—the author discusses (a) communication and influence in research areas and (b) the structure of social relationships between research areas. Each topic is examined from two viewpoints: characteristics of the relationships themselves, and factors associated with growth and development of these relationships.

(a) *Communication and influence in research areas*—using sociometric techniques, Crane studied research areas concerned with rural sociology and with mathematics. In both groups highly productive people were seen as being more influential than less productive people. Crane discusses how the concepts of the "invisible college" (an elite of mutually interacting, productive scientists in an area) and the "social circle" (where members come together on the basis of their interest rather than propinquity or ascribed status) fit the phenomena she studied.

(b) *The structure of social relationships between research areas*—studies of "invisible colleges" have produced information on how information moves from one group to another. Communication among groups comes from a desire for originality on the part of the scientist in a problem area. "Scatter" of knowledge is necessary for cross-fertilizing, just as the existence of a "core" is necessary for the accumulation of knowledge.

Crane concludes by recommending that isolated scientists be brought into closer contact with scientists who are the foci of communication networks. The latter, who sift and channel information, are likely to be more useful in orienting their colleagues to research areas than are computers, which are unable to evaluate the potential relevance of information.

64

RESEARCH UTILIZATION: SOCIAL
Utilization conference

ANALYSIS

Criswell, Joan H. Research utilization in poverty situations. *Rehabilitation Record,* March-April 1969, 7-11.

Purpose

This paper, originally presented at a research utilization conference on rehabilitation in poverty settings, explores ways in which the techniques and approaches of vocational rehabilitation developed through research and demonstration projects can be applied to persons living in poverty.

Method

The material is, for the most part, drawn from Dr. Criswell's experience as chief of the Rehabilitation Research Branch, Social and Rehabilitation Service.

Findings and Conclusions

1. The author identifies the research conference (such as the one in which this paper was presented) as an effective utilization technique which "most typically occurs when one or more projects have come up with enough promising findings so that the time seems ripe to take stock of what is known, acquaint the consumer with what is now ready for application, and point the way to gap-closing or

consumer involvement research projects" (p. 7).

2. A number of vocational rehabilitation projects have been concerned with dependency behavior and have generated approaches applicable to poverty. For example, the paraprofessional rehabilitation aide was a forerunner of the "New Careers" concept.

3. A new trend is identified: greater freedom and creativity among experimental subjects—"Subject Power." It is pointed out that when potential recipients of a service take part in the planning of a demonstration project and help to carry it out, the result is virtually "instant" utilization. This type of self-directed activity is particularly appropriate for demonstration projects among the economically disadvantaged.

65

RESEARCH UTILIZATION: MILITARY

Utilization factors

CASE ANALYSIS

Croker, George W. Some principles regarding the utilization of social science research within the military. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science*, vol. 1. Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 112-125.

Purpose

The author undertakes to use the Air Force as a laboratory in which to examine the process of change. This is particularly appropriate because he examines certain aspects of Air Force activity during a period in which it was undergoing far-reaching changes and in which it utilized social science research. Drawing from his experience in a military setting, he proposes to develop some principles that govern the utilization process—if not social change itself.

Method

The paper consists of discussion and analysis of four research projects conducted between 1949 and 1954 under the direction of the Air Force's social science research agency. On the basis of this discussion, some generalizations are made concerning the problem of utilization of social science research within a military setting.

Findings and Conclusions

1. In the social sciences, utilization of research is inseparable from the conduct of the research itself. It must begin when the research begins, run concurrently with it, and extend beyond it. It cannot be taken for granted or treated passively.

2. Effective utilization depends on recognition of the total situation that can affect or be affected by the results of the research.

3. Effective utilization of social science research which is designed to aid top policymakers must take into consideration the unitary nature of the total process of national security preparation. (NOTE—this implication relevant to military setting only.)

4. Effective utilization of social science research is often handicapped by the practitioner's failure to understand its nature; that is, he assumes that social science is less precise and less reliable than the physical sciences—which is, in the opinion of the author, fallacious reasoning.

5. Utilization seldom works on a "shot-in-the-arm" principle. A decision by a policymaker seldom if ever in itself accomplishes change. Positive and continued effort must be exerted to accomplish the changes that research indicates are desirable.

6. In the Air Force setting, the linkage should be provided by the use of officers serving as quasi-social engineers rather than by use of trained social science research personnel for such a purpose because: (a) It takes less time and effort to "re-tool" the officer than to indoctrinate the social scientist with the complexities of the Air Force; and (b) the officer exerts a symbolic "plus" for utilization, since he is already a member of the "in" group. (NOTE—this implication is relevant beyond the military setting.)

66

RESEARCH UTILIZATION
Knowledge dissemination: technological Change agency

CASE STUDY-ANALYSIS

Crowe, R. E. and Madancy, R. S. *The U. S. Environmental Agency's experience in technology transfer.* Washington, D.C.: Office of Research and Development, U. S. Environmental Protection Agency, 1974.

Purpose

The study purports to demonstrate the greater effectiveness over a passive mass dissemination program of an active program of information dissemination designed for specific users and employing mechanisms calculated to impact the decision-making process of targeted users. To this purpose the program goals, activities, and mechanisms employed by the Environmental Protection Agency since 1971 are described.

Method

The activities and mechanisms of the Agency are set forth by informed members of the staff. The impact of the program is assessed by reference to the extent of its activities, the responses of interested parties, and the increase in the recorded number of municipal waterwaste treatment facilities across the country employing the newer technology as disseminated by the Agency.

Findings and Conclusions

1. In 1968 relatively few plants employed an advanced municipal waterwaste system despite a major U.S. Government research, development, and demonstration program in the water pollution areas from 1955 to 1970, the findings of which were included in "literally hundreds of research information reports published and made available through the U.S. Government Printing Office at a modest fee."

2. The efforts of Technology Transfer initiated in January 1971, however, dealing with the same waterwaste treatment area, showed obvious signs of success and acceptance in less than a year of operation, and was expanded in 1972 to include industrial pollution control technology transfer activities, which included air pollution as well as water pollution control.

3. Program activities of various kinds were introduced:

(a) A series of pollution control seminars were held throughout the United States. These were designed to transfer the latest usable concepts and design information on waterwaste treatment processes and systems.

(b) A continuing series of publications were circulated for use by various categories of users. These publications were of the following types:
  (1) Design manuals.
  (2) Technical capsule reports.
  (3) Seminar publications.
  (4) Handbooks.
  (5) Process brochures.
  (6) Project brochures.
  (7) Newsletters.

(c) Use of audio-visual media included:
  (1) Technical videotapes for closed-circuit viewing by small groups of engineers.
  (2) Nontechnical motion pictures of successful full-scale demonstrations of new technology.

(d) Professional organizational involvement consisted of familiarizing organizations with the program and of contributing to major conferences held by a wide range of organizations.

4. Program mechanisms are described under the following headings:

(a) Organization mechanisms.
  (1) The Technology Transfer Program functions as an office in EPA's Headquarters Research and Development Organization.
  (2) Ten EPA regions have a contact man for Technology Transfer.

(b) Production mechanisms.
  (1) Needs are identified.
  (2) A careful evaluation mechanism is em-

ployed with respect to Technology Transfer products.

(c) Dissemination mechanisms.

(1) The dissemination process is accomplished by means of Headquarters' staff and budget.

(2) The process is controlled to assure rapid and efficient response to requests from users.

5. Although program impact is difficult to assess, it is obvious that technology transfer has had a major impact on decision making.

67

KNOWLEDGE DIFFUSION

Diffusion factors

Communication theory

CASE STUDY

Dahling, Randall L. Shannon's information theory: The spread of an idea. In *Studies of innovation and of communication to the public. Studies in the utilization of behavioral science,* vol. 2. Stanford, Calif.: Institute for Communication Research, Stanford University, 1962, pp. 117-140.

Purpose

The purpose of the study was to find out how scientific ideas come into use and the way in which they spread.

Method

The new idea selected as the basis for this study was Dr. Claude E. Shannon's mathematical theory of communication, first set forth in two articles that appeared in the "Bell System Technical Journal" in July and October of 1948. Dahling charted the dissemination of this idea through other professional journals between 1949 and 1955. The disciplines through which the idea spread included computer, electronics, psychiatry, psychology, engineering, educational psychology, biology, physiology, radar, linguistics, biosociology, library science, optics, education, statistics, social science, and journalism (in the order enumerated).

Findings and Conclusions

1. An idea is often drawn from a flurry of current related activity, and, as it develops, gains impetus and speed of adoption from the same surrounding activity that gave rise to it.

2. The development and adoption of an idea is speeded by a clearly apparent need for the idea.

3. The idea spreads fastest in the discipline in which it develops because: (a) related work going on in the discipline presents a more favorable condition for the spread, (b) authority of the source of the idea is recognized and accepted, and (c) vocabulary and methods are familiar.

4. An idea spreads more rapidly from one discipline to another when it clearly deals with matters of common interest.

5. An idea spreads more rapidly when it is in a language common to more than one discipline.

6. An idea spreads to other disciplines in proportion to its congeniality with their methods.

7. An idea spreads to other disciplines in proportion to its analogic and suggestive value.

8. An idea often gives rise to research and study centers which stimulate and shape its development.

9. The spread of a scientific idea via the popular mass media is limited.

68

CHANGE PROCESS: GOVERNMENT
Change taxonomy

SEMINAR REPORT

David, Paul T. Analytical approaches to the study of change. *Public Administration Review,* September 1966, 26, 160.

Purpose

To present ideas on the processes of change and, specifically, the changing relationship between government and the environment.

Method

The ideas presented in the article were developed from a seminar course on the processes of change.

Findings and Conclusions

1. Three basic assumptions provided the framework for further development of ideas. They were:

(a) The more important problems of government and public policy are typically the product of processes of change.

(b) The major processes of contemporary change are relatively few in number; and each has characteristics giving it identity and a degree of autonomy, despite the complexity of the interaction among the processes and the resulting appearance of overlap and confusion.

(c) It is both possible and important to disentangle the major processes for separate study.

2. A taxonomy of change processes evolved. Change processes include: (a) growth processes and their concomitants; (b) innovative processes of science, technology, and invention; (c) ideological processes, belief systems and their impact; (d) conflict processes—mass conflict, revolution, and war; (e) communicative and learning processes; (f) predictive and policy processes; and (g) leadership and control processes.

All of the processes are clearly involved in a complex interaction with each other, but each has a separate identity. The first four processes are producers of change (desired or not). They may be influenced, controlled, directed, or conceivably stopped completely in some circumstances, but to the extent that they operate, change will occur. The final three processes are preventers of change, channelers of change, or restrictors of change. The remainder of the article is devoted to a discussion of the organization of instructional units utilized in the seminar and a discussion of the importance of structure in learning.

69

ORGANIZATIONAL CHANGE
Innovation factors
Change models

ANALYTICAL MODEL

Davis, H. R. Change and innovation. In S. Feldman (Ed.), *Administration and mental health.* Springfield, Ill.: Charles C. Thomas, 1973.

Purpose

1. To discuss the increasingly changing environment which confronts the administrator in the mental health field. Davis gives examples of the kinds of change that are occurring and examines some of the forces both fostering change and resisting it.

2. To survey models and approaches in the field of change management. Administrators tend to

produce organizational change either by fiat or, on the other extreme, by letting their behavior speak for itself. Davis outlines more conscious ways of planning change.

3. To present the author's "A VICTORY" model of organizational change management. "A VICTORY" is an acronym for the various aspects of change management which require attention.

4. To discuss possible uses of the A VICTORY model.

Method

Davis writes for the mental health administrator who wants to familiarize himself with the outlook and methodology of change measurement. He cites the increasing pace of change in our society and discusses the problems and opportunities which the changing environment presents to the mental health administrator. He draws extensively from both popular works on change and the organization development literature.

The author then outlines one model of organization change, the A VICTORY model, in some detail, illustrating from cases and from his own experience as a consultant. He discusses the use of this model and includes checklists of questions about its various parts for the use of those trying to apply it.

Findings and Conclusions

1. Administrators of mental health programs find themselves continually dealing with problems of innovation and change. Success of a mental health program may depend upon how skillfully the administrator manages change processes within his organization.

An increasing tempo of societal and individual change can be predicted. There seems to be a growing tendency for individuals to want to change more as they achieve self-actualization. Another clear force for change in the mental health field is a swiftly mounting body of knowledge. Legislation, court decisions, crises, and new consciousness of human rights all militate toward change. Technological developments also foster change: e.g., new developments in information retrieval and change techniques.

Full use of current change technology appears to be hindered by some prevailing assumptions about planned change. Some administrators feel that using power, authority, or money to bring about change is easier than employing more tedious change management techniques. This assumption may be valid at times, but simplistic adherence to it has proved to be a false economy. Other administrators feel that if an innovation is sufficiently worthy, it will naturally be adopted on its own merits. But the hidden jungle of conflicting personal motives, characteristic of many organizations, can subvert even the most promising innovations.

2. When it comes to planned change management, a legitimate question is "Does it work?" A blanket answer is not easy to produce. Davis cites evidence that the use of planned change in certain circumstances yields results. Management styles, for example, have been shown to be responsive to planned change approaches. In mental health services, the adoption of research results has been found to increase dramatically with the use of techniques to promote their utilization in program change.

Among models of change, the two most familiar are concerned with structural approaches (e.g., decentralization) and technological approaches (e.g., computerization of management information systems). But they tend to disregard people. "People approaches" involve either manipulation or equalization of power. Humanistic approaches are becoming more popular now; they feature such techniques as participative management, sensitivity training, and organizational development. Another recent model, experimental social innovation, combines aspects of the structural, technological, and people approaches.

3. The author, basing his analysis on criteria suggested by Chin (1969) and others, sets forth twelve characteristics that a model of change should have if it is to be of use in everyday organizational situations:

(a) The model, above all, should be practical.
(b) The parts of the model should be manipulable.
(c) Economy of use should be a primary consideration.
(d) Ease of communication is important.
(e) The model should be comprehensive.
(f) Synergism—the force of factors working together—is important to consider.
(g) The model should lend itself to intervening in phases.
(h) Differential investment in working with the components of the model should be possible.
(i) The model should call attention to how the change process influences the rest of the system.
(j) The model should be flexible and versatile

enough to apply to different organizational systems.

(k) The model should provide a basis for a subsequent evaluation of the effectiveness of change.

(l) The model should recognize the humanness of the participants involved.

The "A VICTORY" model is an attempt to incorporate all these characteristics.

4. The author describes his "A VICTORY" model, the name comprising an acronym for factors he presumes are related to organizational change. These factors are: *Ability* (fiscal, manpower, and physical resources required); *Values* (consonance between the organization's characteristics and the nature of the proposed change); *Information* (pattern for action and its characteristics and communication); *Circumstances* (environmental features or events relevant to the change); *Timing* (critical phases of events relevant to the change); *Obligation* (awareness of the need to change, including both front-stage and back-stage motivations); *Resistances* (inhibitors of the change, both rational and irrational); *Yield* (felt benefits from participating in the change).

5. Use of the A VICTORY model involves four major steps: (a) looking at the organization's current *status* with regard to each factor; (b) goal definition based upon this analysis; (c) action steps to modify conditions within each factor; and (d) follow-through, including evaluation and recycling toward maximizing benefits of the change. It is in conjunction with the first and the third steps respectively that the author presents very detailed sets of questions or suggestions, thus providing the change practitioner with specific guidelines for assessing the potentials of a change situation and for carrying out activities calculated to achieve a desired innovative program. In either case, the numerous listed items are systematically arranged according to the eight factors comprising the A VICTORY model.

70

EVALUATION UTILIZATION

Innovation adoption process
Change factors
Evaluator/change consultant

ANALYTICAL MODEL

Davis, H. R. and Salasin, S. The utilization of evaluation. In E. Struening & M. Guttentag (Eds.), *Handbook of evaluation research* (Vol. 1). Beverly Hills, Calif.: Sage Publications, 1975.

Purpose

The treatise seeks to place evaluation within the context of change and knowledge utilization. To that end it examines the status of evaluation utilization, depicts the evaluator in a dual evaluation/change consultant role, reviews a number of research-development-dissemination-utilization models, and gives a detailed account of the rationale and the component elements of the A VICTORY model similar in certain respects to the presentation in Davis (1973).

Method

The authors draw upon their extensive knowledge of the literature and upon their experience in endeavoring to enhance both knowledge utilization and evaluation of innovative projects in the field of mental health.

Findings and Conclusions

1. Evidence indicates that evaluations can appropriately affect the utilization of programs and practices, despite the existence of instances where evaluations have been found to be methodologically and conceptually unsound. Aside from the appropriateness in the use of evaluation, factors affecting effectiveness are mentioned, including a greater concern with consumer benefits than compliance control as such. The distinction between summative and formative evaluation has a bearing on the appropriateness and the utilization of evaluation, as does the extent of collaboration between the evaluating supra-ordinate agency and the peo-

ple representing the program being evaluated. Since the nature and quality of evaluation is crucial to utilization, there should be more evaluation of evaluations.

2. The significance of utilization in the evaluation field is underlined by the growth of interest in evaluation over the past few years and the concurrent insistence on accountability. The magazine, *Evaluation*, has attracted a readership far above original estimates. Nevertheless, evaluators often experience frustration in their work because of less-than-hoped-for implementation of evaluative findings. It is suggested, on the one hand, that evaluators need to modify their expectations, particularly with the timing and form of the utilization of evaluative results; and on the other hand, they need to extend the range of their roles to encompass change consultation.

3. The need for an evaluator/change consultant role can be readily demonstrated in terms of the relative absence of combined treatment in the literature. Thus, among 600 references to evaluation, only 5 percent pertained to utilization; a review of 1,200 references to utilization revealed only half that percentage as pertaining to evaluation. Although the assumption of a consultant role is not without problems, a closer liaison is considered desirable in balance.

4. The treatise presents a summary of materials concerning change and information processes in terms of various sorts of models. Several publications that attempt to summarize or distill the voluminous literature on the subject are listed.

5. The authors set forth, with illustrations, the nature and application of the eight components of the A VICTORY model with special reference to the assessment and the achievement of programs or practices, as previously enunciated in Davis (1973). These factors, or characteristics, affecting change are reduced to sets of specific questions the evaluator/change agent may ask in assessing the *likelihood for adoption* and in *enhancing that likelihood*. A scale is presented for facilitating the application of criteria in the assessment phase of the four-step process of: (a) assessment; (b) goal definition; (c) action; and (d) follow-through.

6. The presentation is concluded with the speculation that the A VICTORY technique, as a human action model, may well be "just an ordering of common sense."

71

RESEARCH UTILIZATION: SOCIAL WORK

Researcher-practitioner gap

ANALYSIS

Dexter, Lewis A. On the use and abuse of social science by practitioners. *American Behavioral Scientist*, 1965, 9(3), 25-29.

Purpose

The author warns the practitioner of the possible dangers confronting the user of social science research.

Method

The paper, originally presented to a group of psychiatric social workers, is developed around three themes: (1) dangers facing users of social science research, (2) the sociology of occupations or professions as a potentially useful research area for psychiatric social workers, and (3) the relevance of political theory for increasing awareness of one's function and role. The analysis is based on the author's knowledge and experiences.

Findings and Conclusions

1. Experts generally tend to assume that the purposes of those whom they advise are the same as their own. This frequently is not true.

2. There is a tendency for practitioners to become followers of intellectual fads and fashions. Often only a fragmentary part of a given social science is in vogue for study; therefore, the practitioner is likely to be misled by the overemphasis on that one aspect.

3. There is a tendency for practitioners to make

use of research findings as universal answers. There are very few universal answers. One of the greatest needs of social practice is to discover better techniques for overcoming the tendency in human beings to find what they are looking for.

4. The author suggests that in the face of our tendencies to follow fashion, many relevant ideas and approaches of considerable pertinence are overlooked or unknown because they are not fashionable. The sociology of occupations or professions is one such area. The author advocates the use of research findings from this area by psychiatric social workers.

5. The field of political philosophy has fallen out of fashion, so practitioners are hardly aware of its tremendous relevance to their decisions, actions, and policy problems. The author asserts that political theory is probably the most relevant skill for increasing awareness about one's function and role.

72

CHANGE PROCESS: MENTAL HOSPITAL

Change factors
Innovative programs

EXPERIMENTAL STUDY

Dykens, J. W., Hyde, R. W., Orzack, L. H., and York, R. H. *Strategies of mental hospital change.* Boston: Commonwealth of Massachusetts, Department of Mental Health, 1964.

Purpose

This study describes and analyzes the process of innovation in the Northampton mental hospital in Massachusetts, from 1960 to 1963. The goal of this study was to find answers to a variety of questions: should change come slowly, with maximum consensus of hospital people, or rapidly with less consensus? What are the steps in the change process? Among them, which steps are more important for successful change efforts, and which are less important? What are the sociological processes involved in mental hospital change? What are the individual and personal processes related to institution change? What is the effect on staff and patients of the hospital's relationship to the community?

Method

A questionnaire designed to test staff morale in relation to community involvement was circulated in 1961. The sample population included all medical, social service, and occupational therapy members of the staff, and those nursing service personnel working in the admissions and continued-treatment buildings.

In addition to the questionnaire, the project was devoted to developing a variety of programs. At the termination of the project 64 programs were enumerated in which the project had participated in some substantial degree. They included research; new patient services; augmentation of existing patient services; volunteer acquisition and supervision; recruitment other than volunteers; education of outside students and citizens; in-service education; augmentation of internal communication, planning and interdepartmental relationships; and community relations.

A major goal of these programs was the strengthening of hospital-community relations. Visits were exchanged in one program with colleges and the university, and student volunteers were recruited.

To add breadth to the project, it was compared with nine other hospital improvement projects.

Findings and Conclusions

1. The assumption that the morale of a hospital staff is related to frequency and type of interaction the staff has with members of the community outside the hospital was supported in part by this initial investigation.

2. Decision making at the hospital featured informality. Change in such a setting should occur through informal channels when those informal channels characterize the usual course of events in the hospital, and when the value system of the hospital staff does not sanction more directed and

time-limited attempts to induce change rapidly.

3. An acceptance of informality and gradualness does have some drawbacks: (a) a system of informal exchanges among staff is probably *by itself* unlikely in any systematic and urgent way either to generate change or to compel interest in change in current programming; (b) informality in exchange relationships among staff and between institutions such as a hospital and a university, is not by itself likely to encourage creativity in thinking about or working toward long-range, complex and demanding goals. Informality would seem to be adaptive rather than stimulating.

4. Careful studies of morale and turnover showed that morale was high and turnover of personnel was low.

5. State hospitals probably have resources of which they are unaware: the psychologist may have a good new thought about ward management, the social worker may have a new understanding about a patient's family which could help the psychiatrist create a new total plan for his work with the patient. Each treatment team member might profitably reflect ideas with colleagues, in order to find new solutions to problems.

6. State mental hospitals are subject to external pressures from a variety of sources, including local communities and the supervising central office of the State mental health agency. The external pressures may assist or hinder the creative process within the institution. Consideration of them should be included in strategies for mental hospital change.

7. In comparison with nine other hospital improvement projects, it was found that the characteristics utilized in this one study had quite general applicability.

8. Change efforts ultimately should be directed toward assisting hospital people to become their own agents for change.

9. In the change relationship, the strategist should place his initial effort in understanding the direction, speed, and content of change already occurring in the hospital. Such understanding can be aimed at helping the hospital reach toward its own goals. Those goals about which the strategist and hospital people are later unable to reach consensus can be modified more easily if there is some earlier agreement about other change.

10. Hospital people may have difficulty in finding directions or areas for change, time for change, or skills to effect change. Those difficulties can be at least partly solved by the strategist and the hospital people working together.

11. The strategist needs to understand the meaning of the lack of change efforts, or of the factors that have prevented successful and creative change efforts. He can profitably look along the time dimension and thus into the past history of change in the hospital as well as its current and future plans.

12. Mutual participation in change efforts may lead to positive and constructive feelings and can further enthusiasm for change. The process of change is most successful when any of its aspects arise from within the person or persons the strategist would hope to change.

73

RESEARCH UTILIZATION: EDUCATION

Research utilization models
Researcher-practitioner collaboration

CASE ANALYSIS

Eash, Maurice J. Bringing research findings into classroom practice. *Elementary School Journal*, 1968, 68(8), 410-418.

Purpose

The purpose of the paper is to examine several approaches to applying research findings in the classroom.

Method

The author presents three models for translating research into classroom practice. These models reflect data from the literature and from the au-

thor's experiences. Two case studies are presented in amplification of the preferred model (coaction).

Findings and Conclusions

1. The process most widely used in bringing research findings into classroom practice is the *displacement model.* The desired change is, in effect, forced upon teachers and pupils because it displaces a similar component. (Examples: new textbooks, introduction of programmed instruction.) Among the disadvantages of the displacement model are:

(a) There is no assurance that the research will be used with any degree of consistency.
(b) The displacement procedure usually requires a heavy economic commitment by the school; this tends to stifle criticism (including useful feedback) on the part of the practitioners.
(c) It conceptualizes the instructional process as an assembly line, overriding the human factors.

2. The *authority model* assumes that the classroom practitioner need only to be exposed to research and he will put it to use. In this approach, researchers, acting in an authoritative role, bring the findings to practitioners. The drawbacks to this model are:

(a) Research findings are generally introduced without translating them into the context of the classroom practitioner, who works with a multitude of variables that may not be accounted for in the original findings.
(b) In the interaction between researcher and practitioner, there is an implication that the teacher is inadequate—which heightens tension.
(c) When findings are introduced in a group meeting without follow-up, there is little incentive for practitioners to adopt new findings that require modification of practice.
(d) Offsetting the forces that undertake to bring about change through formal channels of authority, informal structures in the organization mobilize forces to resist the change.

3. The *coaction model* is based on the assumption that the use of research findings must be a two-way action that engages the researcher and the practitioner in a mutual task. The author's position is that the element of reciprocity in this model enables it to correct the inadequacies of the other two models.

4. The coaction model often involves the intervention of an outside agent (change agent) who should have a broad knowledge of research findings, an understanding of classroom functioning, the ability to translate research findings from other contexts into the classroom setting, and skill in interpersonal relationships.

74

RESISTANCE TO CHANGE: EDUCATION

Innovation
Innovation rejection

EMPIRICAL STUDY

Eichholz, Gerhard C. Why do teachers reject change? *Theory Into Practice*, 1963, 2, 264-268.

Purpose

The author explores the rejection of newer audio-visual innovations in a school environment in order to test his theory of rejection. Eichholtz's theory of rejection closely parallels commonly accepted adoption models. He postulates an awareness stage, an indifference stage, a denial stage, a trial stage, and finally rejection.

Method

SAMPLE

A sample of 45 teachers was drawn from five elementary schools in a large metropolitan school

system. Selection criteria were: grade level (15 teachers from each of the following grade levels: 1-2, 3-4, and 5-6); teaching experience (15 teachers from each of the following ranges of experience: 1-3 years, 7-10 years, and over 15 years); and known innovation rejector.

PROCEDURE

Each teacher included in the sample was interviewed with an open-ended questionnaire designed to uncover feelings toward the newer media. All interviews were over an hour in length, tape recorded, transcribed, and evaluated in terms of attitudes toward specific innovations. These attitude statements were tabulated on the basis of a previously developed rejection classification system.

An inventory of the newer media available at each school was also compiled and checked against the teachers' responses concerning this equipment.

Findings and Conclusions

1. Attitudes of rejectors were not related to the grade level at which the teacher taught, or to the number of years of teaching experience.

2. Real reasons for rejection and stated reasons for rejection were not always the same.

3. No teacher rejected *all* of the new media.

4. Although the postulated stages of rejection appeared to hold, it was necessary to revise the postulated forms of rejection. The new classification derived was as follows:

Form of rejection	Cause of rejection	State of subject
1. Ignorance	Lack of dissemination	Uninformed.
2. Suspended judgment	Data not logically compelling	Doubtful.
3. Situational	Data not materially compelling	1. Comparing. 2. Defensive. 3. Deprived.
4. Personal	Data not psychologically compelling.	1. Anxious 2. Guilty. 3. Alienated.
5. Experimental	Present or past trials	Convinced.

5. The following were suggested as ways of overcoming resistance:

(a) Circulate information.
(b) Let innovators lead the way.
(c) Maintain an environment conducive to experimentation.
(d) Be sympathetic, wait for pressure for innovation to mount.
(e) Remain sympathetic to failure, for the attempt may eventually lead to acceptance.

75

RESISTANCE TO CHANGE: EDUCATION

Innovation
Innovation rejection

EMPIRICAL STUDY

Eichholz, G., and Rogers, E. M. Resistance to the adoption of audiovisual aids by elementary school teachers. In M.B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 299-316.

Purpose

The purpose of this paper is to illustrate the convergence between two major intellectual traditions (education and rural sociology) focusing on the diffusion of innovation, using data from an investigation of the rejection of audiovisual aids by elementary school teachers.

Method

The subjects were 45 elementary school teachers who, on the basis of pretesting, were determined to have rejected electromechanical innovations for classroom use. They were interviewed with an open-ended questionnaire designed to uncover their feelings toward audiovisual aids. On the basis of the findings, the authors attempt to formulate a theory of rejection, in which parallels can be cited for the five phases previously identified as comprising the adoption process: awareness, interest, evaluation, trial, and adoption.

Findings and Conclusions

1. The following types of rejection responses were reported:

(a) *Rejection through ignorance*—innovation unknown or too complex to be understood.
(b) *Rejection through default*—innovation known but subject not interested in its usage.
(c) *Rejection by maintaining the status quo*—not used in the past and accordingly not acceptable.
(d) *Rejection through societal mores*—not accepted within context of subject's society.
(e) *Rejection through interpersonal relationships*—friends not using innovation.
(f) *Rejection through erroneous logic*—seemingly rational but actually unfounded reasons given for rejection.
(g) *Rejection through substitution*—stressing practices which *are* used, to warrant rejecting innovation.
(h) *Rejection through fulfillment*—subject already knows best way to teach, hence innovation is unnecessary.
(i) *Rejection through experience*—has tried new techniques and feels they have failed.

2. On the basis of the foregoing, the authors formulate the following framework for the identification of forms of rejection:

(a) *Ignorance*—caused by lack of dissemination of information.
(b) *Suspended judgment*—because the data are not logically compelling.
(c) *Situational*—because the data were not materially compelling.
(d) *Personal*—because the data are not psychologically compelling.
(e) *Experimental*—because past or present trials were not successful.

3. Paralleling the above five forms of rejection, the authors propose a (tentative) rejection theory in which the process is made up of the following phases: awareness, indifference, denial, trial, and rejection.

76

RESEARCH UTILIZATION: REHABILITATION

Research dissemination

CASE STUDY

Engstrom, G. A. Where we stand on research utilization. *Rehabilitation Record*, November-December, 1969, 28-32.

Purpose

This paper undertakes to examine and account for the headway which has been made by the Social and Rehabilitation Service (SRS) in strengthening its efforts in research utilization since the appointment, less than three years ago, of a research utilization task force.

Method

The paper was developed on the basis of information at the disposal of the author in his position as Chief of the Research Utilization Branch of the SRS Division of Research and Demonstration Grants.

Findings and Conclusions

1. SRS has undertaken a series of publications called "Research and Demonstration Briefs," which serve as a linking agent between practitioners and researchers. They present digests of completed projects in which the methodology has been verified but the findings and implications for practice need further visibility.

2. The agency is preparing to publish a series of "Research Trends" which will disclose the preliminary findings of projects currently in progress in an attempt to shorten the time gap between the testing and the application of those findings.

3. Project directors of all SRS-funded projects

are now required to include in final reports a separate listing of significant findings.

4. All final reports, since the inception of the rehabilitation research program, are now being abstracted; each abstract will describe the problem studied, how it was investigated, the major results, and their usage potential.

5. SRS is updating bibliographic and indexing tools for the use of rehabilitation practitioners.

6. It is experimenting with the value of a research utilization laboratory to aid in modification of demonstration projects for widespread adaptation. The pilot laboratory, conducted by the Chicago Jewish Vocational Service, is taking research results of earlier projects related to sheltered workshops, modifying the programs to make them applicable to a variety of agency conditions, and preparing operating guidelines for their use by agencies and counselors.

7. It has introduced a new team member in State rehabilitation agencies, the Research Utilization Specialist, who will serve as change agent. Nine State agencies are utilizing this new function on a 5-year demonstration basis.

8. It has sponsored a number of research utilization conferences, each focused on a specific subject, to encourage the researcher, the practitioner and the administrator to explore the ramifications of new findings and to develop recommendations for action.

9. It is planning demonstrations of how a variety of media (films, for example) can more effectively be used to achieve better communications for the rehabilitation and welfare fields.

77

RESEARCH UTILIZATION
Change agency
Utilization measures

ANALYSIS AND SUGGESTIONS

Engstrom, G. A. Research utilization: The challenge of applying SRS research. *Welfare in Review*, 1970, 2, 1-7.

Purpose

The article reviews the development of the Social and Rehabilitation Service (SRS), discusses the relevancy of its research and demonstrations programs to the SRS community, and points up current efforts to put into practice research findings that should improve the role of applied research as an essential component of better service to recipients.

Method

Descriptive analysis.

Findings and Conclusions

SRS was created in order to unify services that previously had been offered separately.

1. *The historical perspective:* Prior to the creation of SRS, the Vocational Rehabilitation Service (VRA) and the Welfare Administration (WA), now both parts of SRS, laid the groundwork for SRS' research utilization arm.

In the first research effort, VRA initiated several projects aimed at demonstrating the efficacy of rehabilitation programs for persons who were totally and permanently disabled. A formal agreement was developed between the Social Security Administration and state divisions of vocational rehabilitation (DVRs) that provided for the use of social security trust funds to rehabilitate persons who had been determined to be totally and permanently disabled and who were drawing social security benefits. Since then more than 24,000 persons have been rehabilitated under the agreement; and cost-benefit studies have proved the wisdom of the action.

Another VRA-funded project demonstrated the feasibility of employing mentally retarded persons. In addition, the U.S. Civil Service Commission, with the advice and cooperation of VRA, established a special hiring authority for mentally retarded persons. Under the program, the Federal employing agency agrees to use the services of state DVRs in carrying out the hiring authority and, with the help of rehabilitation counselors, to identify jobs suitable for retarded persons.

WA's Cooperative Research and Demonstration Program initiated a number of significant studies to explore the effects of dependency on the population at large which were useful in planning new programs and drawing up legislative proposals.

The growing body of knowledge created a need for a clearinghouse for research findings, and there was growing concern that effective research findings were not being put into practice. In 1966, Mary Switzer, Commissioner of Vocational Rehabilitation, appointed a Task Force on Research Utilization to identify significant research findings to use in rehabilitation programs. Also, a group of administrators and educators in vocational rehabilitation met in Miami, Florida, to examine the dissemination and use of rehabilitation research information.

The Task Force on Research Utilization made 13 recommendations, 11 of which have been adopted and are being followed. One of the most visible results is the *Research and Demonstrations Brief*, one-sheet, two-page roundups of completed research projects, issued monthly by the SRS' Research and Utilization Branch. The R&U Branch also publishes *Research*, an annotated list of all projects supported by the Division of Research and Demonstrations and the Division of Research and Training Centers. Another printed outlet is the periodical, *Welfare in Review*, issued every other month by the office of the administrator, SRS. It reports on the findings of major studies in social service and rehabilitation.

2. *The gap between research and practice:* While dissemination of knowledge is a vital part of research utilization, the diffusion of new ideas is only the initial step of putting them into practice.

(a) There is considerable evidence that at least part of the gap between research and practice is directly attributable to the difference in the value systems of researchers and administrators and an accompanying lack of communication between them.
   (1) At a research utilization conference conducted by the Institute for Community Studies in Kansas City in 1968, descriptive scales were given to administrators and social scientists. The study conclusions indicated that researchers and administrators did not have the same values.
   (2) Wolfensberger describes the dilemma of research in "human management agencies." He points out that the agency administrator must decide whether he wishes to initiate and support research within his agency, what type of research he wishes to support, and whether he can accept or tolerate research conducted in the agency by investigators who are not a part of the agency system.

(b) Glaser and Taylor studied factors influencing the success of applied research. Their study, conducted under a grant from NIMH, produced 64 findings the investigators thought significant in the life cycle of the projects they examined. From these findings, four components crucial to a successful outcome were identified:
   (1) A good idea soundly conceived and tied into current agency needs.
   (2) Commitment to and energy invested in the project by a leading person, usually the principal investigator.
   (3) The support of other persons in the environment of the study who need to know about the research project.
   (4) The ability to obtain the acceptance and cooperation of others in and out of the project who are not so directly involved and motivated as the research team (though they are important to the project's outcome), but who will cooperate if they are treated with respect, courtesy, and consideration.

   Though Wolfensberger speaks from the agency's view and Glaser from the investigator's, they both stress the need for mutually defined and accepted objectives for a study, commitment from all concerned, the recognition that change is stressful, and a tolerance for the challenge stress introduces. Both report from the premise that the application of research demands attention from the beginning to the end of an investigation and even afterwards.

(c) Glaser conducted an earlier study for SRS on factors affecting the use of research findings by vocational rehabilitation agencies. The study offers promising guidelines for improving the incorporation of findings from R&D projects into agency practice. It also demonstrated the value of a face-to-face enabling process between practitioners, administrators, and researchers. This idea has been refined and is now called a research utilization conference. Havelock provided substantiation for Glaser's premise.

3. *Closing the gap:*

(a) The first utilization conference with a distinct methodology based on objectives in public welfare was conducted in Minneapolis in 1970 by the Demonstration Projects Branch of SRS' Division of Research and Demonstrations.

(b) In 1969, SRS made a grant for a 5-year demonstration project in one state of each HEW region to demonstrate the advantages of placing a research utilization specialist (RUS) in the state vocational rehabilitation agency to work for more effective use of research findings. Some movements toward innovation already have been identified. For example, in California, the RUS helped introduce into the State's in-service training program some of the findings on continuing education identified by the University of Iowa.

(c) Often, demonstrations successful in the program of the sponsoring agency are not widely adopted elsewhere because the unusual functions or operations of the demonstrating agency cannot be relocated elsewhere without disrupting the operations of the adopter. To circumvent this problem, SRS is supporting demonstrations of research utilization laboratories or field testing stations. Their purpose is to take approved and effective research within a certain category, adapt it to the laboratory, and replicate the findings with at least one other similar agency.

(d) SRS has lacked a central information base for research findings from which generalizations for practice can be made. To correct this deficiency, the Research Utilization Branch has a contract to review, abstract, and index final reports emanating from all research and demonstrations arms of SRS, except the Division of Mental Retardation which has an abstracting system. This effort will offer for the first time a central register and index of research findings for practitioners and administrators.

(e) The new efforts for research utilization appear successful, but further developments are needed. The aspects of SRS responsibilities that require research should be set up in the order of their use to guide both the researcher, and review panels and monitoring agents. Program staff members—the potential users of the findings—have a key role to play by maintaining a close look at use throughout the life of the project. Also plans must be made as early as possible in the demonstration for the dissemination, replication, and implementation of key findings.

78

CHANGE PROCESS: BUSINESS
Planned change

ANALYSIS AND SUGGESTIONS

Erwin, P. H., and Langham, F. W., Jr. The change seekers. *Harvard Business Review*, January-February, 1966, 44, 81-92.

Purpose

A logical analysis of how to plan for change in business.

Method

The ideas in this article are based on the broad experience and observations of the authors.

Findings and Conclusions

1. Viable organizations must have an attitude that change is normal and inevitable. A key to success, indeed to survival in the future, must surely be to generate an attitude that change is normal. Top managers must be change seekers.

2. Any change should be approached simultaneously on two fronts, the logical and the psychological. The logical aspects are concerned with determination of all the facts, forecasts, alternatives, and practical advantages and disadvantages of the situation. The psychological approach is required in order to gain acceptance of change with a minimum of resistance. While the logical factors are

often dealt with superficially, too frequently the psychological factors are wholly ignored.

3. Plan the change far enough in advance so that all people affected will have sufficient lead-time to:

(a) understand the change and accept the need for it;

(b) decide how their individual talents can be employed to contribute to the change;

(c) adjust their wants and needs to be compatible with organizational wants and needs; and

(d) receive recognition for improving the total work situation through solving an interesting and exciting problem that will prove beneficial to the organization and the society in general.

4. Conflict between administrators and initiators must always be expected. To quote Chief Justice Hughes, "Conflict is one of the laws of life. It can be dangerous or it can be harnessed to progress."

79

ORGANIZATIONAL FACTORS
Innovation: business
Innovative staff proposals

EMPIRICAL STUDY

Evan, W. M., and Black, G. Innovation in business organizations: Some factors associated with success or failure of staff proposals. *Journal of Business*, 1967, 40, 519-530.

Purpose

An analysis of some of the factors affecting the success of proposals for innovation submitted predominately by staff specialists to line management.

Method

The findings in this paper are based on a study of a small sample of business organizations. The dimensions of the innovation process investigated in this study were:

(a) Attributes of the proposal for innovation; character of the new idea. For example, does it involve a radical change, is the outgrowth of research of high or low quality, etc.?

(b) Attributes of the structure of an organization that facilitate or inhibit the implementation of new ideas. For example, does decentralized or centralized structure facilitate innovation?

(c) Attributes of the staff-line relationship that affect the innovation process. For example, how adequate are the communication channels between staff and line?

Findings and Conclusions

1. Staff proposals were more likely to be successful in organizations with:

(a) a higher competitive position;

(b) a higher degree of professionalization of staff personnel;

(c) a higher degree of formalization of rules;

(d) a higher degree of communication between staff and line personnel;

(e) a higher degree of quality of proposals;

(f) a higher degree of perceived need for proposals; and

(g) a lower degree of professionalization of management.

2. The variables of: (a) Managerial receptivity to change, (b) degree of centralization, (c) size of organization, and (d) number of proposals per manager, were eliminated as being less important in discriminating between the success and failure of staff proposals.

3. The study further found that organizations characterized by: (a) a higher degree of formalization and centralization, (b) a higher degree of communication between line and staff, (c) a higher level of quality proposals, and (d) a higher level of managerial receptivity to change were likely to receive administrative proposals.

4. Organizations that: (a) were larger in size, (b) had a higher degree of professionalization of management, and (c) had a larger number of proposals per manager were likely to receive technical proposals.

80

INNOVATION: HIGHER EDUCATION

Resistance to change
Innovator characteristics

EXPERIMENTAL STUDY

Evans, R. I., and Leppmann, P. K. *Resistance to innovation in higher education: A social psychological exploration focused on television and the establishment.* San Francisco: Jossey-Bass, 1968.

Purpose

This is a social psychological exploration of the role of university faculty in the diffusion of innovations in the university. The authors also report the findings of an experiment designed to determine the effects of actual experience with an innovation or attitude and behavior change.

Method

After reviewing the studies that explore values, beliefs, and other personality characteristics of university faculty and how they affect the process and function of innovation in higher educational institutions, the authors surveyed the faculty of a university in a metropolitan university where instructional television was being introduced to ascertain attitudes toward instructional television. This initial survey indicated that the majority of the faculty was opposed to the use of television in their classes.

EXPERIMENT

1. *Subjects*—in order to determine the effects of experience with an innovation on change in attitudes, the authors then conducted an experiment using 20 faculty members who were almost equally divided into pro-instructional television, anti-instructional television, and neutral with respect to instructional television groups. The remaining 100 members of the faculty served as a control group.

2. *Treatment*—those individuals in the experimental group were asked to prepare, produce, and participate in at least one 45-minute presentation to be recorded on a video-tape recorder. In addition, as a means of increasing commitment, all members were asked to collaborate in the production of several video tapes, which represented a cooperative effort.

3. *Data Collected*—the subjects were offered consultation and help in preparation. The television production coordinator, a member of the research team, completed a detailed written report on the quality of each tape and the verbal and nonverbal behavior of each participant. Each experimental subject was asked to write a report on his experience and his opinion of the video-tape recorder as a device for improving teaching.

Findings and Conclusions

1. In comparing those individuals who were pro-innovation with those who were against the innovation the authors found that those in favor of instructional television were:

(a) Less conservative, less traditionally oriented, and perhaps, in a way, less "scholarly" and "academic" in the narrow sense of the word.
(b) They tended to feel the university climate can and should include some noncurricular or extracurricular activities.
(c) Their attitudes toward teaching and student evaluations were also more "positive"—
  (1) they were willing to teach on television, more likely to prefer smaller classes and more likely to be intrigued with teaching methods;
  (2) they were more willing to receive additional training, and far more eager to experiment with various instructional methods, such as class demonstrations, field trips, motion pictures, television viewing, and even teaching machines and television lectures; and,
  (3) they were willing to utilize student feedback and reported more variation in evaluating student performance.

2. In the interview situation the pro-innovation faculty were judged to be more tolerant and sophisticated and less hostile and bland.

3. Pro-innovation faculty had also taught at more institutions than those who were against instructional television.

4. The anti-instructional television professors

were academically oriented, valuing the straight lecture method as most significant. They were able to state a significantly larger number of disadvantages to television instruction than the pro-innovation faculty.

5. Those faculty who were initially opposed to instructional television exhibited an attitude change in the direction of more positive feelings toward it; however, this trend was not statistically significant. Changes in attitude also occurred among those members of the control group who had heard about the video-taping experiment. There was little or no change in those faculty members who had no contact with the experimental group.

6. The pro-innovation faculty, in general, produced slightly higher-quality tapes than the anti-innovation faculty. However, there were some high-quality tapes produced by the anti-innovation faculty.

7. The findings and analysis drawn from this in-depth study in one university and the investigation of faculty attitudes on nine other campuses leads the authors to these conclusions:

(a) Many professors seem to think that much training, equipment, and general reevaluation of teaching goals would be required in order to utilize instructional television.* Further evidence suggested that if a complex innovation such as this could be broken down into palatable bits it might be more readily acceptable.

(b) The authors also found that the source from which the innovation is introduced affects the attitudes of the adopters. The degree of innovation acceptance by professors may partly depend on whether they viewed the innovations as being instituted or imposed by the university administration or whether they felt that it originated within their own departments.

(c) Some institutions seemed to provide a more receptive social climate for the introduction and acceptance of innovations. Some institutions appear to encourage innovation by rewarding the innovator through increased rank, salary, or other fringe benefits. These institutions had a more innovative faculty.

(d) The authors also suspect that job security may be intricately involved in innovation adoption in higher educational institutions.

*The authors' conclusions are also in line with those from other studies of innovation in organizational settings.

81

APPLIED SOCIAL RESEARCH
Innovation: social
Research-practitioner collaboration
Social experimentation
Research: marginal groups

ANALYSIS AND SUGGESTIONS

Fairweather, George W. *Methods for experimental social innovation.* New York: Wiley & Sons, 1967.

Purpose

The principal purpose of this book is to provide possible answers to two questions:

1. How can society effect needed changes in ongoing social processes with a minimum of disruption? The proposed answer is to create new social subsystems; their methods would include innovating models as alternative solutions to social problems, experimentally evaluating them, and disseminating the information to those who can make the appropriate changes.

2. How can this be done? The answer to this question is by the methods of experimental social innovation presented by the author.

Method

The ideas in this book have been developed by the author during the course of 13 years of experimental work aimed at solving the problems of several marginal groups, such as chronic mental and tubercular patients, criminals, etc.

Findings and Conclusions

1. Distinguishing features of social innovation experiments are: (a) These experiments create new social subsystems which clearly define the statuses and roles of the participating members; (b) the new subsystems, which are designed as alternative solutions to significant social problems, are systematically varied, controlled, and compared; (c) the experiments should be imbedded in selected social institutions so that they are an integral part of that society and are established so that society need only passively accept them and need not support or endorse them; (d) social innovative experimenters must assume responsibility for the members participating in the subsystems. This last characteristic is particularly important; social innovative experimental methods are a special combination of service procedures and research techniques.

2. The author discusses the entire research process in great depth. Of particular relevance is his analysis of factors relating to obtaining administrative commitments necessary for the success of the effort. One of the first obstacles to social innovative research in a rehabilitation setting is the traditional separation of research and service.

3. Unless the researcher can elucidate how the research might help solve some of the vexing problems faced by the organization or aid in the accomplishment of institutional goals, it is unlikely that management will approve of the project.

4. Care must be exercised in clearly communicating to management the importance of insulating the service units involved in the research from any institutional practices that might destroy the research. Management should agree that once experimental procedures have been established, they cannot be changed until the project is completed.

5. The tendency of some administrators to agree to research projects because of the prestige attached without full knowledge or appreciation of their obligations can cause numerous problems when the time comes for management to back up their commitment with space, staff, etc. This "Yes-No" phenomenon among administrators is less likely to occur if the researcher has asked concrete questions about administrative obligations.

6. Another common source of difficulty is the frequently held preconception by institutional management that research will bring additional services to the institution without cost to the institution; i.e., management views the research budget as a supplement to the agency budget for use in paying for the existing service programs rather than as funds for meeting new research needs. In order to prevent such a misunderstanding the researcher should clearly describe the use of the research budget to management.

7. Agreement concerning publicity to be given the project should be made in advance.

8. The matter of publication rights should be clearly agreed upon prior to the research effort.

9. In order to avoid possible conflicts and establish mutual understanding and agreement, the researcher should raise the following questions to management:

(a) What will be the amount of the research budget?
(b) Will management grant the researcher the authority to select institutional residents to go to the research unit when this is required for sampling purposes?
(c) If important individuals within the institution complain about the research unit simply because it receives special consideration, will management continue supporting it?
(d) Will management be willing to provide needed personnel?
(e) Will space be provided the research team?
(f) Will there be arrangements for computer analysis of the data?
(g) Will management respect its commitments and not request the researchers to violate the research design or to participate in the usual institutional procedures when to do so would curtail their full-time research effort?

10. In return, the researcher should assure management that:

(a) He will not violate any of the existing institutional norms except those agreed upon by both parties as an inherent part of the research.
(b) He will give periodic progress reports to management.
(c) He will not change any of the agreed-upon procedures without specific permission from management; upon the emergence of any unforeseen difficulties involving the institution, he will request a meeting with management to discuss these problems.

11. Research or social innovation experimentation conducted in a broader community setting requires the following considerations:

(a) Agreements should be obtained from and goals clearly elucidated to affected community institutions, so that their representatives can become, if they wish, a part of the innovative experiment.

(b) Since superficial boundaries that separate a community from an isolated institution cannot be maintained, reciprocities should be arranged with both a selected institution and representatives of the larger community.

12. If a particular successful project is to be considered worthy of wider dissemination, a determination must be made as to whether or not its results can be generalized to solve the existing problem in the society. This depends upon three conditions:

(a) How representative the original sample is of the problem population in a society.
(b) How representative the experimental social context is of the social context in which the problem is typically found in a society.
(c) How the criterion for evaluating the success of the project compares to society's consensus of the solution to the problem.

13. Following a social innovative experiment, the researcher must clearly state his inferences, cite the evidence for his conclusions, and make recommendations about social change to the interested agents of a society.

14. Where a recommended solution is adopted by a society, members of the research team should, in addition to publishing written reports, function as social action consultants to aid in the implementation of programs based upon their research results.

15. The recommendation is made that a number of centers for experiments and training be established in universities, industrial institutions, government agencies, or private foundations. Such centers would:

(a) Continually initiate new social innovative research.
(b) Establish a communication system between the community and itself and thus be a mechanism for change.
(c) Provide a sharing of information and cross-fertilization of ideas.
(d) Help establish administrative procedures for implementing community and institutional reforms.

82

SOCIAL EXPERIMENTATION
Innovation: social
Research methodology

ANALYTICAL MODEL

Fairweather, G. W. Experimental social innovation defined. In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes, and R. J. Lewicki (Eds.) *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

The author outlines the methodology and qualities of experiments in social innovation.

Method

The author defines experimental social innovation by outlining the general attributes or goals of social innovation experiments, and also by presenting the various methodological techniques which may be employed by experimenters in researching social problems.

Findings and Conclusions

1. The attributes of social innovative experiments are described as follows:

(a) *Definition*—defining a significant social problem.
(b) *Naturalism*—making naturalistic field observations to describe the parameters of the problem in its actual community setting.
(c) *Innovation*—creating different solutions in the form of innovative social subsystems (i.e., more functional regrouping of social systems).
(d) *Comparison*—designing of experiments to compare the efficacy of different social subsystems in solving a particular social problem.
(e) *Context*—implantation of the innovated subsystems in the appropriate social settings in

order that they may be evaluated in their natural habitat.

(f) *Evaluation*—continuing the operation of the innovated subsystems for several months or even years to allow adequate outcome and process evaluations to be made.

(g) *Responsibility*—assumption of responsibility by the researchers for the lives and welfare of participants in the subsystems.

(h) *Cross-disciplinary*—using a multidisciplinary approach, with the nature of the particular social problem determining the subject matter of the specific discipline(s) invoked, e.g., political science, sociology, etc.

2. The six methodological approaches to the investigation of social problems are:

(a) *Descriptive*—theoretical discussions of or treatises on important social problems which allow the formulation of hypotheses and summarize empirical facts to illustrate theoretical positions about social problems.

(b) *Survey*—such data-collecting activities as demographic studies which serve to define the variables operating in social problems.

(c) *Laboratory studies*—artificially created conditions for learning and performing activities centrally related to the social problem (e.g., studies of racial identification in children).

(d) *Participant observation*—such data-gathering methods as interviews, testing, questionnaires, etc., which are primarily employed to define the variables of the social problem.

(e) *Services*—establishing new social subsystems by providing services, e.g., Synanon, Alcoholics Anonymous, etc.

(f) *Experimental*—a method which may combine all the above methods, as well as include other procedures. This method is characterized by the author as the one method which encompasses all eight of the attributes or goals of social innovation outlined in number one above.

83

ORGANIZATIONAL CHANGE
Innovation: mental health
Change factors

EMPIRICAL STUDY

Fairweather, G. W., Sanders, D. H., and Tornatzky, L. G. *Creating change in mental health organizations.* New York: Pergamon Press, 1974.

Purpose

Specifically, the book describes an attempt to achieve the acceptance and adoption of an innovation in mental hospital after-care treatment known as "the community lodge," and to study factors accounting for such adoption. Broadly extrapolated, its purpose is to raise and throw light on the question: How does a society change the structure and function of its complex organizations in an orderly way so that much needed problem-solving social change may continuously occur?

Method

Mental hospitals numbering 255—virtually all in the United States—were approached through carefully designed procedures to find out whether they would, with certain assistance by the investigators, introduce the community lodge innovation. While a number of respondents permitted intermediate contact to learn more about the program, only 25 were actually persuaded to adopt the innovation.

Through long telephone interview-conferences, questionnaires, brochures, tapings of workshop sessions, and a research diary, information was communicated to and/or from hospital personnel and patients. The obtained data covered descriptions of the course of adoption and information relative to the many factors that might possibly affect that process.

In a follow-up study all 255 hospitals were contacted to ascertain the diffusion of the idea of the community lodge, or elements associated with it.

The experimental design to ascertain the role of

the several factors, such as the nature of the approach to the hospitals, the manner of assistance given adopting institutions, the characteristics of the institutions, etc., was carefully drawn. It entailed rather precise sampling procedures, a variety of assessment devices, and appropriate statistical analysis.

Findings and Conclusions

1. For the most part, the community lodge adoptions followed the proposed pattern whereby instead of remaining hospitalized, chronic patients lived and worked at a center or lodge in the community, establishing their own business and governing themselves. In some instances they held jobs in the community. Over a five-year period their progress compared favorably with that of matched and randomly assigned patient groups. Patient costs were reduced.

2. A number of factors were found to be unrelated to whether or not a hospital adopted the innovation:

(a) Financial capability.
(b) Size and geographical location.
(c) Whether state or federally supported.

3. Observations concerning factors that were found to be related to adoption:

(a) The more active approaches, such as demonstrations, contributed more to willingness to introduce the innovation than less active ones, such as receipt of literature on the program.
(b) There had to be outside change-agent pressure to help inside workers in initiating the change.
(c) It was necessary to locate and help small change-oriented groups within the organization.
(d) The organizations where many people made the decisions changed more readily than those where only top management was involved.

4. Additional observations concerning the change process:

(a) Advocates of change were found about equally in each of the professional groups.
(b) Change-oriented attitudes as expressed verbally did not necessarily assure changed behavior.
(c) Political power contributed little to the spread of the innovation.

5. The above findings and a number of additional ideas are presented, if not as principles, then at least as hypotheses. From these a set of practical pieces of advice for change agents are derived.

6. Noting a number of deficiencies in the American pattern of decision making regarding social policy problems, the authors urge the experimental tryout of model programs as part of a new problem-solving social change mechanism, to be institutionally supported by centers for social innovation.

84

CONSULTANT ROLE
Linkage functions

ANALYSIS

Ferguson, Charles J. Concerning the nature of human systems and the consultant's role. *Journal of Applied Behavioral Science*, 1968, 4(2), 179-193.

Purpose

The author conceptualizes the consultant role in a systems framework and describes the processes that the consultant uses to help the client system externalize disruptive tendencies and move toward collaboration of its subparts.

Method

The article is based on the author's experiences and intellectual analysis.

Findings and Conclusions

1. All human systems, whether individual or collective, consist of a synthesis of subparts and

subsystems. It is the nature of the relationship between subparts or subsystems that makes for collaboration and health of the system or for imbalance, stress, and dysfunction.

2. Every boundary between system parts offers an opportunity for collaboration or competition. Collaboration and competition are natural forces; interdependent subsystems naturally compete. Competition is often stimulating to a system; it is not undesirable, per se.

3. The consultant's focus is the management of relationships or interfaces between subparts or subsystems. He determines what can be done to evoke collaborative tendencies among subparts and/or to reduce the tendency toward destructive competition among interdependent subparts.

4. The consultant uses himself to help a client system externalize and explicate "nonfit" between interfaces or along boundaries. He uses himself to release forces within the system that move it toward balance and health.

5. A number of functions or activities of the consultant may be identified:

(a) *Capture data*—the consultant listens and observes; he finds cause-and-effect relationships, identifies symptoms of stress, and locates the strengths of the system.

(b) *Scan for troubled interfaces*—the consultant acts as a radar device; he detects distortions and misinterpretations in the interactions of system components.

(c) *Promote psychological bonding*—he helps establish mutual identification, communication, understanding, and concern among system parts.

(d) *Act as linking agent*—he links people who need to be brought together, arranges confrontations, and promotes effective interpersonal communication.

(e) *Serve as communications conveyor*—the consultant serves as an auxiliary communication medium; he can convey data more freely than formal channels and moves critical attitudinal data along and spreads awareness.

(f) *Suspend animation and analyze the process*—he temporarily neutralizes real authority by asserting his own authority as a consultant so that the uses and consequences of the real authority may be studied. Because he is not wrapped up in the problem-solving process, he can speak to the need to stop the action and analyze the process objectively.

(g) *Clarify formulation of issues*—the consultant cuts through the emotional smoke.

(h) *Release emotional issues*—he brings out feelings by raising key issues and assists in working them out; he serves to legitimize discussion and consideration of feeling.

(i) *Make communication congruent*—he assists in evoking more honest, authentic interchanges and can monitor communication and exercise "quality control."

(j) *Encourage feedback*—he develops two-way or multichanneled interchanges among system parts.

(k) *Promote a spirit of inquiry*—he promotes the examination of data and helps develop in others an ability to dig up data and a spirit of learning.

(l) *Coach and build teams*—he acts to release the supportive capacity of group members and fosters the sharing of experiences and concerns.

(m) *Assist in the management of conflicts*—he fosters acceptable confrontation and clarifies the dimensions of conflict.

(n) *Promote a proper psychological climate*—by his own attitudes toward conflict and its resolution he serves as a model.

(o) *Take calculated risks*—he is able to take risks in stretching perception and creating awareness that those who are locked into a system may not be so prepared to take.

85

RESEARCH UTILIZATION: BEHAVIORAL SCIENCE

Utilization factors
Evaluation procedures

CASE STUDY

Flanagan, John C. Case studies on the utilization of behavioral science research. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science*, vol. 1. Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 36-46.

Purpose

To report on two studies in the behavioral science field that were similar in many ways but differed markedly in the extent to which the results have been utilized.

Method

Two studies, both carried out by the American Institute for Research (of which Dr. Flanagan is director), were compared with respect to a number of factors. Both studies related to the development of new evaluation procedures for the client organization. In the case of one study (the development of an evaluation procedure for hourly wage employees) the findings were extensively utilized. In the other (the development of an objective proficiency check for private pilot certification), there was only limited utilization. The author draws conclusions concerning the reasons for the differences.

Findings and Conclusions

1. The following conditions were present in both situations and are assumed to be important in determining utilization of research findings:

(a) Research was based on data collected from actual field operations.
(b) Procedures which were developed were tried out under field conditions.
(c) Those responsible for the ultimate decision to use the findings were included in the planning.
(d) Projects selected were not beyond the state of the art; effective techniques were available for carrying them out.

2. The following conditions existed more recognizably in the project with extensive utilization than in the one with limited utilization—hence they are assumed to be particularly conducive to utilization:

(a) The requirements of the study originated with the persons responsible for using the findings.
(b) Top management was sensitive to the need for improvements in the area being studied.
(c) The ultimate users took part in collecting data and evaluating results.
(d) The decision makers and the ultimate users perceived the change as resulting in definite personal benefits to them.
(e) The potential benefits were tangible and readily evaluated.

3. There seemed to be no relationship between the conclusiveness of evidence favoring adoption of the new procedures and the extent to which they were actually adopted. That is, credibility may not be as important as other studies indicate.

86

INNOVATION ADOPTION
Innovation characteristics
Innovation: agriculture

EMPIRICAL STUDY

Fliegel, F. C., and Kivlin, J. E. Attributes of innovations as factors in diffusion. *American Journal of Sociology*, 1966, 72(3), 235-248.

Purpose

The objective of this study was to identify a specific set of attributes of innovations and to explore the extent to which these attributes accounted for differences in rate of adoption of innovations in modern farm practices.

Method

The sample was made up of 229 relatively prosperous, fairly homogeneous farm operators from a single county in Pennsylvania; they were all sole owner-operators of medium-sized, commercial dairy farms. The adoption histories of these farmers with respect to 33 innovations was explored. A list of 15 innovational attributes was drawn up: initial cost, continuing cost, rate of cost recovery, payoff, social approval, saving of time, saving of discomfort, regularity of reward, divisibility for trial, complexity, clarity of results, compatibility, association with dairying, mechanical attraction, pervasiveness. The farmers (by a split sample interview procedure) were asked to rate the 33 innovative farm practices with respect to each of the 15 attributes. The investigators were aware of the possible interrelationships involved in the impact of the various attributes; partial correlation was used in reporting the outcomes, to isolate the effect of any given attribute on rate of adoption without disregarding the effects of all the others.

Findings and Conclusions

1. Initial cost involved in adopting an innovation was not a deterrent to rapid adoption for this sample.

2. High continuing costs did, to some extent, deter rapid adoption.

3. Rapid recovery of costs was not positively related to rate of adoption.

4. Payoff (magnitude of return) was positively associated with rate of adoption.

5. Social approval (that is, noneconomic returns) did not seem to be an important factor in explaining rate of adoption.

6. The saving of worktime was a positive factor with respect to rate of adoption, but less so than the investigators had hypothesized.

7. Relief from odious tasks was a relatively unimportant factor in this context.

8. Regularity of reward (that is, the perception that an innovation will produce the desired results over repeated trials) was positively associated with rate of adoption.

9. Divisibility of trial (that is, the extent to which the innovation lends itself to small-scale tryout before full adoption) was an important factor in encouraging rapid adoption.

10. The perceived complexity of an innovation was less of a deterrent to rapid adoption by this particular sample than the investigators had anticipated.

11. Similarly, the clarity of results had a weaker positive relationship to rate of adoption than had been anticipated.

12. Compatibility between the innovation and the traditional way of doing things was not an important factor in explaining rate of adoption (though the investigators reported reservations about the validity of their findings in this respect).

13. Association with dairying was a relatively important factor in explaining rapid adoption.

14. Mechanical attraction was not an important factor in adoption decisions.

15. Pervasiveness (that is, the possible ramifications resulting from the acceptance of a given idea) was not a significant deterrent to rapid adoption.

16. On the basis of the foregoing findings, the investigators advanced the following conclusions:

(a) In commercially oriented situations, innovations perceived as most rewarding and involving least risk and uncertainty are accepted most rapidly.

(b) In situations involving less emphasis on commercial considerations, it is logical to expect that more importance would be attached to

the communicability of new ideas and their effects.

(c) A potential adopter's main occupational interest has a "halo" effect in contributing to rapid adoption of innovations most closely allied to that interest.

87

INNOVATION: EDUCATION
Change: classroom teaching practices

EXPERIMENTAL STUDY

Fox, R. S., and Lippitt, R. The innovation of classroom mental health practices. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 271-299.

Purpose

To study the process involved in the instigation and support of teacher innovation in improving the classroom learning climate.

Method

This experimental study, which was carried out at the University of Michigan, hypothesized that teachers might be encouraged to make changes in their classrooms either by: (1) collaboration with the research team in gathering and interpreting data about the state of affairs in the teacher's own classroom, leading to innovations designed to modify the situation; or (2) examining the innovative efforts of other teachers in meeting situations similar to ones believed to exist in one's own class.

The project was carried out in the following phases:

1. Conceptualization of the professional growth process that stimulates the emergence of innovations in teaching practice relevant to improvement of mental health and learning conditions; and conceptualization of the conditions within a school system necessary to facilitate the spreading of such innovations.

2. Development of a battery of instruments to explore aspects of the classroom group structure, peer standards toward learning and classroom behavior, teachers' self-concept, teaching objectives, pupil desire for change, etc.

3. Recruitment of a sample of 30 collaborating teachers who underwent an extensive measurement program.

4. Stimulation and support of teachers with respect to innovative practices, carried out at three levels:

(a) Nine teachers were provided maximum involvement, with a 6-week full-time summer workshop to sharpen diagnostic skills and plan new programs. This group also had clinic sessions and consultation throughout the year.

(b) A total of 10 teachers were provided medium involvement. They did not attend the summer workshop but received a program of feedback conferences during the school year through area meetings and through consultation.

(c) The remaining 11 teachers had minimal involvements—no summer workshop; no feedback and interpretation of their classroom data, no consultation.

5. A year after the initial recruitment, extensive remeasurement was carried out.

6. Planned spread of innovations was carried out, but at the time the paper was prepared this phase was still in process and no data were included concerning this aspect of the study.

Findings and Conclusions

1. Teachers participating in the intensive summer workshop became the most highly involved, attempted the greatest number of new ideas in their classrooms, and were most successful in bringing about some changes.

2. A teacher's generalized concern for improvement can move toward a more precise attack on a specific problem as precise facts about the interpersonal situation in the classroom become available.

3. The innovative efforts of teachers can be highly useful to their colleagues who find themselves

facing similar problems in their own classrooms. However, the channels of communication are so poorly developed that little such sharing takes place.

4. To help make educational innovations visible and available to potential adopters usually required descriptive effort and conceptual help by a trained outsider.

5. To stimulate active adoption efforts by colleagues of innovators often required value re-education to overcome the attitude that using someone else's innovation is a better value than creating one's own.

6. Innovative efforts by the classroom teacher, with informed and sympathetic support from school administration, professional colleagues, and outside resource people are much more likely to succeed than attempts without such support.

88

KNOWLEDGE UTILIZATION
Utilization barriers
Knowledge integration

ANALYSIS

Frank, Lawrence K. Fragmentation in the helping professions. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 44-48.

Purpose

The author draws attention to the barriers raised by our tendency to specialize.

Method

The ideas in this chapter of the book are based on the broad experience and observations of the author.

Findings and Conclusions

There is a lack of integration of knowledge from the various sciences and social sciences. Individuals tend to draw only from their field of "specialization" when looking for solutions to problems. In addition, each specialist, confident of his own knowledge and techniques, tends to ignore the far-reaching implications of his findings.

89

CHANGE PROCESS: SOCIAL
Change process: education
Innovation: bureaucracy

ANALYSIS

Freire, P. *Pedagogy of the oppressed.* New York: Herder & Herder, 1972.

Purpose

To present the basic concepts of political consciousness-raising as part of a perpetual revolution; to discuss a pedagogy intended to help oppressed groups become aware of the conditions in which they live and become able to deal critically and effectively with their situation.

Method

Analytical. The author draws on the writings of Hegel, Marx, Sartre, Mao, Guevara and several Brazilian writers, focusing their ideas on the subject of teaching itself as either repression or revolution. He developed his teaching method and philosophy by teaching illiterates in the northeast of

Brazil. He was exiled from Brazil after the coup of 1964 and continued his revolutionary teaching in Chile and other parts of South America.

Findings and Conclusions

Two points from the foreword by Richard Schaull relate the book to North American realities. First, we may be as much oppressed by our own technology and by our own organizations as South American masses are oppressed by the ruling classes; second, "There is no . . . *neutral* educational process." What goes on in schools either lulls the student into passivity and oppression, or awakens him to consciousness and action.

According to Freire, the great humanistic and historical task of the oppressed is to liberate themselves and the oppressors as well. The oppressed are afflicted by "fear of freedom," which causes them not to recognize that they are oppressed and to identify with the oppressors rather than with their fellow sufferers. The revolutionary teacher seeks to discover two truths, side by side with the oppressed whom he is "teaching." The first is that they are oppressed, and only by gaining critical consciousness will they see the inequities and contradictions of their situation. The second truth is that they have the power—indeed the historical role—of transforming their own situation. Along with a critical consciousness they gain the confidence to act. The oppressed do not gain consciousness or confidence without the teacher; it is a mutual process.

Whereas oppressive education presents the passive student with pure content (solutions without problems), revolutionary education does just the opposite. It presents no content whatsoever. Freire calls this pedagogy "problem-posing." The students themselves must define the problem and find the answer to it. Here the students *are* the masses; the classroom *is* reality outside. The oppressed become more and more conscious through the *process* of facing real problems. Revolutionary transformation is accomplished not through violent action but through dialogue, which Freire characterizes as an encounter between men, an existential necessity for men who want to achieve significance as men. It cannot occur without faith, love and hope for mankind—or without critical thinking.

Freire discusses how the content of education enters the dialogue. "The starting point for organizing the program content of education or political action must be the present, existential, concrete situation, reflecting the aspirations of the people." He discusses "generative themes" which are the basic social contradictions present in any situation of oppression and which inspire the oppressed to further efforts, once they become aware of them.

Finally, the author reviews the dialogical and the anti-dialogical theories. He discusses the following tactics associated with oppression: conquest, divide and conquer, manipulation, and cultural invasion. Revolutions are always tempted to use these tactics to further their cause. Freire exposes the contradictions in the use of these tactics and argues that they should not be used by revolutionaries. He presents corresponding tactics of liberation: cooperation, unity, organization, and cultural synthesis. According to Freire, these alone further the cause of true liberation.

The book is thought-provoking, and provides concepts to be kept in mind in any change process.

90

INNOVATION
Innovation: scientific; technological; social

CASE STUDY-ANALYSIS

Gabor, Dennis. *Innovations: Scientific, technological, and social.* New York: Oxford University Press, 1970.

Purpose

In presenting historically and critically 137 inventive and innovative developments—73 "hardware" inventions and innovations, 27 biological innovations, and 37 social innovations—the book seeks to engender a more knowledgeable view of future possibilities in order to encourage rational control of the accelerated tendency to innovate that has marked our times.

Method

Aside from his personal background of experience, which is extensive, the author has drawn his set of innovations from a list of one hundred inventions and innovations compiled by Herman Kahn and Anthony J. Wiener of the Hudson Institute, later incorporated in their book, *The Year 2000: A framework for speculation on the next thirty-three years*; from the work of Olaf Helmer, formerly of the RAND Corporation and later associated with the Institute for the Future, which published a list of 76 innovative items; and from contributions from a number of specialists in various fields.

In the summaries the hard, factual material is presented interpretively to draw attention to significant human issues and to the possibilities for beneficial and harmful consequences of further development of the several lines of innovation, or in the social field, reform. In the case of a number of the innovative trends, prediction of probable date of realization is offered based on the application of the DELPHI technique developed by Helmer and his associates.

Findings and Conclusions

The specific case accounts of inventions and innovations under the heading of "hardware" cover the fields of: materials, power, chemistry, transport, communications, computers and data processing, robots, automation, education and entertainment, space, ocean research and exploration, and peace inventions.

Biological innovations are presented under two headings: food, and bio-engineering.

Social innovations, or reforms, are considered under the following headings: human ecology and ekistics (problems and science of human settlement), fighting crime and corruption, monetary and economic reforms, internal and international peace, and toward a stable, mature society.

While the author's conclusions relative to the vast amount of data presented are largely specific to each of the 173 items, a number of general conclusions are offered in the introductory sections of the book. They include the following:

1. What is now called innovative still has a strong instinctive element in it.

2. Innovations have been devised by two different constructive types of minds, and both were suppressed for long periods by the third type of man, who cared neither for technology, nor for social progress, but only for power.

3. Modern technology has reached a stage at which it can destroy all civilization, at least temporarily, or create a new and happier world.

4. Having fought nature and his own kind for perhaps a hundred thousand years, man will have to fight his own nature; ultimately this must be the aim of any far-sighted innovator of our times and in the years to come.

5. At present there is a terrifying imbalance in innovations: innovation of the technological variety has become compulsive.

6. The scientific-technological complex we have created will produce more innovations, almost automatically, by its own inertia, but novelties far more important in their human and social implications can be expected from the biological sciences, which as yet have much smaller establishments.

7. Insane quantitative growth must stop; but innovation must not stop—it must take an entirely new direction, namely towards improving the quality of life rather than its quantity.

8. The scientist and the technologist have again become united, as they were at certain times in the past.

9. Invention has changed from an individual to a group and mass phenomenon.

10. Historically the change in the intrinsic nature, aims and consequences of the process of invention and innovation entails three factors: the change in the time-scale, the change in the magnitude and social consequences of the innovation, and the change in scope and aim.

11. It is a commonplace that social development has not kept up with the explosive progress of science and technology.

91

PLANNED CHANGE: EDUCATION
Organizational factors
Innovation
Change agent

ANALYTICAL MODEL

Gallaher, Art, Jr. Directed change in formal organizations: The school system. In R. O. Carlson, et al., *Change processes in the public schools.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1965, pp. 37-51.

Purpose

The author explores the nature of change from the viewpoint of the anthropologist, stressing the importance of the role of an advocate in planned change. He examines the organizational peculiarities of school systems and the implications of these for direct change.

Method

The author has based his analysis on his own knowledge, experience, and observations.

Findings and Conclusions

1. Change is a natural consequence of human social life. Change can be either directed or nondirected. Directed change is defined as "a structured situation in which an advocate interferes actively and purposefully with the culture of the potential acceptor."

2. There are two major role models for advocacy:

(a) The *pragmatic* advocate role model rests on the premise that success or failure in directed change is referable mainly to the advocate's understanding of the content and internal organization of the pattern where change is sought. The role behavior prescribed by this model is concerned mainly with creating a climate that is conducive to change.

(b) The *Utopic* model is based on the premise that "one can achieve results best by doing things to, or planning for, people rather than with them." It defines the advocate's role as one of manipulation to gain the acceptance of a given innovation. The author views the pragmatic model as best for achieving genuine change.

3. Gallaher highlights several variables he feels are crucial in the success of directed change programs. They include: (a) the perceived prestige of the advocate by members of the target system, (b) the dependence upon authority of the members of the target system, (c) the expectation of change shared by members of the target system, (d) the target system's felt need for change, (e) the time factor, and (f) the size and divisibility of the target system to be changed.

4. The most significant quality of the school as a formal organization is that it is a service organization.

(a) "This means that the prime beneficiary of the organization is the client group, which in turn becomes a crucial variable in determining the limits and kinds of authority that are developed, and the goal orientation that the organization will take."

(b) "The concern of local client groups in the power to legitimate authority, a centrifugal tendency, contrasted to the centripetal one of problems in the local system, and the innovations necessary to solve them, deriving from larger systems—could well be the most difficult problem area for educational innovators."

(c) The task of professional functionaries is probably more difficult in service organizations than in any other kind. They must serve the collective interest of the client group and at the same time retain their authority and not become subservient to the demands of the client group.

5. It is important for the advocate to have prestige, and/or that members of the target system depend upon his authority in matters of change.

(a) The school administrator stands between the client group, technically represented by the school board, and professional and other

functionaries who comprise the educational system. His role is essentially a "balancing role." Were he to assume the role of advocate he might reduce the effectiveness in the balancing role, as the role of advocate in the change process almost always involves conflict.

(b) Rather than place the burden of change on the shoulders of the school administrator, the author suggests the development of a special role function for the management of educational change.

92

CHANGE PROCESS: SOCIAL

Organizational change
Individual reeducation

ANALYSIS

Gardner, J. W. *Self-renewal: The individual and the innovative society.* New York: Harper & Row, 1964.

Purpose

Gardner wrote this essay in the mid-sixties to encourage social activism. He tries to give a new perspective on the sources and meaning of turbulence in the present world.

The greater part of the book deals with the process of change. The author emphasizes (1) the importance of values in directing change and (2) the importance of the individual in changing organizations and society.

Method

To create a new perspective on renewal, the author speaks as a citizen. He draws upon his experience as an administrator and consultant and upon his knowledge of history. Through the use of diverse examples from art, military history, politics, and science, he demonstrates the challenge of renewal in many situations and the role of the individual in meeting the challenge.

Findings and Conclusions

1. The author focuses first on the individual's conception of change, casting a positive light on change and renewal. Change is not automatically symptomatic of decay. In fact, intentional change is a way of achieving stability and avoiding decay.

Just as we narrow the scope and variety of our lives by our own acts, so may we widen our scope through self-renewal. The author discusses the functions of courage, love, motivation, and education in self-change. Innovations need not be world-shattering changes or revolutions. Important change, the author says, can come from successive small innovations or simply from creative, new ways of thinking about things. The creative person is open, independent, flexible, and able to find order in experience. Gardner deemphasizes revolution. He also cites a problem which recurs in history: what to do with the revolutionaries when the revolution is over.

2. In considering the processes of change, both organizational and societal, Gardner focuses first on obstacles to renewal, most of which are to be found in the mind rather than in external factors. Sometimes only catastrophes can change habits, attitudes, and belief systems. Rules and customs often stultify organization members, but every organization must concern itself with how something is done, not just that it gets done. Regulations often protect vested interests, which the author classifies among the most powerful forces producing rigidity and diminishing an organization's capacity to change.

Advocates of change often falsely blame some outside factor: science, technology, or the Establishment. According to the author, the real fault lies in our own, inadequate assessment of the situation. We must learn to "organize for freedom," that is, to design and build organizations which help individual members develop themselves.

The author discusses conditions for social renewal: the preservation of individual choice, pluralism, dispersal of and restraints upon power, tolerance of inconsistency and dissent. For organizational renewal, Gardner advocates system-

CONTINUED

2 OF 5

atic innovation. This could take many forms, e.g., a department whose job is to motivate continuous renewal, a system of personnel rotation, or a conscious effort to find better communications patterns. Planners and policy makers should, in the author's view, get out and see reality in its raw state rather than simply reading reports. Finally, all organizations should combat natural tendencies towards massiveness, immobility, and formality. To do this, we need new organizational forms.

3. In conclusion, the author stresses the importance of the individual as a source of change, pointing out that we must preserve the individual's integrity and help him find a purpose which links him to society.

The mature individual makes commitments beyond himself because man is by his very nature a seeker of meanings. Many find meaning by commiting themselves to the well-being of their families, but some have wider, social commitments. These commitments presume an optimistic, but not unrealistic, attitude towards the future and a consensus of values in the society. This consensus deals with the values which govern behavior, e.g., freedom and justice. In a pluralistic society men will always disagree about the particulars of behavior and about deep, philosophical questions. The individual faces complex problems with moral seriousness, and the society must help him find constructive outlets for his commitment.

93

SCIENCE AND PRACTICE
Research-practitioner relationship
Research utilization

ANALYSIS

Garner, Wendell R. The acquisition and application of knowledge: A symbiotic relation. *American Psychologist*, 1972, 27, 941-946.

Purpose

The author sets out to destroy what he considers to be a myth that favors the separation of scientific research from practical concerns. The scenario of this myth, or fable, he asserts, runs as follows: Scientists acquire knowledge; this knowledge is placed in the public domain; when a person with a problem needs knowledge, he extracts it from the public domain, thereby solving his problem; the scientist's generation of this knowledge takes place in a mysterious fashion; though mysterious, it is so effective that no tampering must be allowed, and in fact, the less contact the scientist has with the problems of the problem-solver, the more apt is he to fill the public domain with knowledge of ultimately greatest import to the problem-solver.

Method

The procedure employed in demonstrating the fallacy of this "mythic" line of thought includes the citing of (a) the overlapping dimensions affecting both pure and applied research; and (b) a number of important instances wherein practical problems sparked a surgence or resurgence of interest in certain basic problems in experimental psychology.

Findings and Conclusions

1. Regarding the categorization of research:

(a) There are at least five meaningful distinctions that scientists make concerning the research process, or the acquisition of knowledge. These are the distinction between:
   (1) Pure and applied research.
   (2) General and specific research.
   (3) Experiment and observation.
   (4) Laboratory and field research.
   (5) Analytic and wholistic research.

(b) These five dimensions are not logically or inherently correlated. For example, applied research can be done in order to produce general results, which are presumed to be of greater importance than particularized findings. Further research on an applied problem, carried out in a field setting, may lead to more generalized knowledge than research

done in a laboratory with no foreseeable real-life application. Hence, although the five distinctions are correlated to *some* degree in practice, this correlation should not lead us to evaluate each aspect of the problem (of pure versus applied research) as though the correlation were perfect.

2. Instances where practical, timely questions caused renewed interest in and added to the fruitfulness of fundamental research are cited in support of a "symbiotic relation" between practice and research in the fields of:

(a) Selective attention, where aircraft control personnel in aircraft control towers had a problem of auditory selection from many messages.
(b) Space perception, where aircraft pilots were faced with the problem of depth perception at distances required in flying and landing a plane.
(c) Speech perception, where research had the very practical goal of telling the engineers how to design telephone systems so that speech communication could be carried on effectively.
(d) Pattern recognition, where it was necessary to provide a computer program which could read letters of the alphabet.
(e) Absolute judgment, where people interested in designing radar systems, primarily for use in aircraft control towers, had to study various stimulus dimensions.

In each of these instances, the practically initiated research led to the development and strengthening of basic theoretical knowledge in the respective fields of inquiry. The author concludes from the above that the quality of basic research is improved by communication between the basic research scientist and the people who have problems to solve.

As a parting shot, Garner refers to the argument that many great discoveries occur serendipitously while basic research is in progress, enhancing its value. Serendipity, he notes, is just as likely with goal-directed research.

94

KNOWLEDGE DISSEMINATION
Innovation: communication, psychology field
Communication process

ANALYSIS

Garvey, W. D., and Griffith, B. C. Communication in a science: The system and its modification. In A. de Reuck and J. Knight (Eds.), *Communication in science: Documentation and automation.* A Ciba Foundation volume. Boston: Little, Brown, 1967, pp. 16-36.*

Purpose

This is, in effect, a progress report on an ongoing study, initiated by the American Psychological Association in 1961. It is assumed by the authors that the outcomes of the study will ultimately furnish a rationale for the management and future development of communication programs in psychology.

The specific purposes of the paper are to describe the total system of dissemination of scientific information in psychology; to point out the order that exists in the system and identify some of the characteristics that contribute to that order; to suggest an approach to communication innovation; and to present examples of three innovations developed and applied to test this approach.

*Much of what is contained in this presentation overlaps with other publications by the same authors, e.g.: Scientific communication: The dissemination system in psychology and a theoretical framework for planning innovations. *American Psychologist*, February 1965, 20(2), 157-164; Scientific communication as a social system. *Science*, 1967, 157(3792), 1011-1016; Scientific information exchange in psychology. *Science*, 1964, 149(3652), 1655-1659; and Studies of social innovations in scientific communication in psychology. *American Psychologist*, 1966, 21(11), 1019-1036. To avoid redundancy, some of the specific data from the four journal articles are incorporated in this summary.

Method

The early phases of this study were exploratory, designed to generate descriptive data of what occurs in the communication process and what roles were played by various media. Subsequent phases were analytical, with the purpose of discovering and describing the orderly processes involved in the communication system.

Concerning the three innovations reported briefly in the paper, two of them (listing of manuscripts accepted by journals with long publication lags and preconvention publication of "Proceedings") are described in detail in an earlier journal (see footnote below). Data for testing these innovations were gathered through questionnaires to both researchers and practitioners, with controls established in both studies.

Findings and Conclusions

1. The authors delineate the mechanics and flow pattern of information from the time it is generated by the research worker until it can be retrieved from a secondary source. The pattern at the time of study included: early informal oral reports at colloquia or at small groups of colleagues working in the same area; formal oral reports at State or regional meetings of psychological societies or at national APA meeting (first public announcement of work is abstract published in program of national meeting); postmeeting distribution of copies of presentation; technical reports (often later enlarged into journal articles); submission of manuscripts to journal (approximately 9 months before publication); invited oral presentation at conferences, etc.; distributions of preprints of journal article; journal publication; distribution of journal reprints; presentation (sometimes) at an international meeting—usually after journal publication; appearance in *Psychological Abstracts* 15 months after journal publication; later inclusion in publications focusing on review of current work (sometimes as long as two years after journal publication). Approximately 200 readers will be exposed to a journal article. Monographs, like books, usually attract the more academically oriented reader and have a limited distribution.

2. The following features of the communication system are cited:

(a) The amount of information flowing through the system which reaches the public is small, compared to that which reaches restricted audiences.

(b) Most of what reaches the public is relatively old.

(c) Scientists actively seek information relevant to ongoing or planned work.

(d) There is an impressive degree of orderliness in the communication system.

(e) The outlets chosen by the research workers are often associated with the specific needs of the user and the information is shaped and reshaped to fit the characteristics of channels and the needs of audiences.

(f) The goal of most scientific information is publication in an archival journal; the limitations implied by this goal give impetus to development of informal channels.

3. The authors describe the communication system as a "genuine social system"; scientific information exchange consisted largely of interaction between scientists; the major elements within the system were social institutions. "Further, this system was a *closed* social system; not only was the scientist a disseminator and user in the very same system of which he was a creator, but the two gross products of science, its information and its manpower, interacted and fed back into the system continuously to drive it" (p. 10). Its characteristics as a social system contributed to its orderly organization.

4. The second characteristic contributing to orderliness was the dynamic interrelationship of the elements within the system. This interaction has social, economic, and formal dimensions.

(a) *Illustrative of the social dimensions*—if scientists are not satisfied with existing elements to meet information needs, they create new elements (such as new publications, new informal channels.) These new elements affect all existing elements in the system.

(b) *Illustrative of the economic dimension*—distribution of information without charge by a government agency might extinguish use of and need for abstracting journal.

(c) Distinct functions of the formal and informal channels within the system are presented as follows:

(1) Formal elements have a potentially larger audience, including the public; informal elements tend to reach a restricted audience (colleagues, etc.).

(2) Information disseminated through formal channels is more permanently stored and more retrievable than that going through informal channels.

(3) Formal channels carry less current information than do informal channels.
(4) Information carried by formal channels is more carefully monitored than that carried by informal channels.
(5) Formal channels are user-selected; informal channels are disseminator-selected.
(6) There is considerable redundancy in the total system, with informal channels contributing to this more than the formal ones.
(7) Exchange of information through informal channels is more interactive than through formal channels—more emphasis on relevance, more openended, more conducive to feedback.

5. The authors' approach to designing and testing innovation in scientific communication encompasses the following elements:

(a) Innovation in a science should be preceded by a study of the existing system.
(b) The selected innovation should move the entire system in desirable directions.
(c) Selected innovations may have an indirect rather than a direct effect in modifying elements within the system.
(d) Innovation should promote effective combination of formal and informal elements handling a single body of information.
(e) Innovation should take appropriate account of the economic factors involved—that is, of the direct and indirect links between information flow and the flow of resources.
(f) Innovations should be so designed that their efficiency and effectiveness can be measured in behavioral and economic terms.
(g) An innovation should be seen as a trial only, with built-in mechanisms for modifying or terminating it, if evaluation suggests these courses.

6. The authors identified several critical points in the system at which breakdown in communication occurred, and developed and tested three innovations directed to correcting this breakdown.

(a) By means of changes in the operational structure of *Psychological Abstracts,* the 15-month lag between publication of information in a scientific journal and its availability in abstract was reduced to 4 months.
(b) To close the lag between the time a manuscript is accepted by a scientific journal and the time it is published, they induced long-lag journals to publish listings of accepted manuscripts so that potential users would know of the availability of the information during a period of time when it is, in effect, buried from the public. It was assumed that such early dissemination would be particularly useful to young scientists who may not be members of the author's "invisible college" and hence not hear about the work informally; these same young scientists are often not the recipients of preprints. The publication of the listing did indeed stimulate many requests for copies of the manuscript; many of the requestors reported that their work was modified by contact with the manuscript and its author; in a small number of cases, information flowed from the requestor back to the author. In short, the innovation did speed up dissemination and stimulate informal interchange.
(c) The most ambitious of the three innovations was the advance publication of selected papers scheduled for presentation at the 1965 national APA meeting. Through the preconvention publication of *Proceedings,* it was hoped to:
(1) Establish an early and widely accessible means of disseminating current research reports in psychology.
(2) Offer an alternative to journal publication, reserving traditional archival publication for long reports of major research efforts.
(3) Facilitate better informal exchange at the convention sessions by virtue of the fact that attendants had the opportunity to familiarize themselves in advance with the research being reported. It was assumed that preconvention publication would—
- enable those attending convention sessions to decide which work was relevant to their own;
- equip scientists with enough advance information to qualify them to discuss specific problems and questions with the author at convention sessions or through correspondence; and
- free up the convention speaker to discuss the implications of his work, since a reasonably public and complete record of his study would have been available.

7. On the basis of their study of the results of the first year (1965) of publication of *Proceedings,* they concluded that most of the anticipated benefits enumerated above did indeed ensue. For example, there was improved interaction at convention sessions; considerable interchange of information among scientists in advance of convention; some evidence that respondents' work was in some way modified as the result of preconvention and convention interchange; and a trend among authors to defer seeking journal publication since a measure of dissemination had already been achieved.

8. The authors enumerate the specific ways in which this particular innovation adhered to the seven criteria they had articulated; since one of those criteria was that the innovation be given a genuine trial and subsequent evaluation, they stress the importance of perceiving the 1965 experience with the publication of *Proceedings* as only one segment of an ongoing process.

95

RESEARCH COMMUNICATION
Diffusion: scientific knowledge
Knowledge dissemination

EMPIRICAL STUDY

Garvey, W. D. and Griffith, B. C. Scientific communication: Its role in the conduct of research and creation of knowledge. *American Psychologist,* 1971, 26, 349-362.

Purpose

1. To discuss the "communications crisis" in science. Many articles are published resulting in so much information that the individual reader is overloaded. Yet, few articles contribute substantially to the pool of psychological knowledge. Committed researchers are a minority among authors of articles.

2. To describe information exchange patterns among highly productive scientists. The authors trace the course of a typical research project from its beginning when an idea is under discussion among colleagues, to its culmination as a published journal article that subsequently is mentioned in current reviews as contributing to the pool of knowledge.

3. To distinguish between the informal, prepublication system of information flow and the formal, postpublication system of monitoring and consolidating knowledge.

Method

The authors summarize findings of a 10-year study on the flow of scientific communication and information exchange patterns in psychology.

Findings and Conclusions

1. *The communications crisis in science*—the number of psychologists in the United States is doubling every 12-15 years; the amount of information (measured by number of abstracts or articles published) is doubling every 15-20 years. The major information problem facing psychology, according to the authors, is that the individual scientist is being overloaded with information.

Consolidating knowledge in psychology is a complicated process because most of the published reports of research are the work of psychologists getting their degrees. After graduation, they tend to go into work other than research. Thus, there are many "first steps" in research that are never followed up.

2. *Activities of the productive scientist*—the exchange of information among the 2,000 "productive" researchers bears closer investigation, particularly because the scientist does not get his ideas strictly from published research. The authors studied over 200 research efforts in psychology and found that less than one in seven originated from ideas obtained from formal sources, such as articles or presentations at national meetings. Instead, the productive minority is highly organized into small clusters of researchers who maintain continual informal contact with each other's work. At the planning stage and while carrying out the research (that is, until there is a complete and defensible report) the researcher interacts and communicates only with immediate colleagues. This is followed by a series of increasingly formal presentations of the

work, including oral reports, preprint distribution, etc., culminating in journal publication of the article.

Because of publication time lag and because key researchers have already seen the results of the study, the published journal article in psychology is no longer an important medium for disseminating *current* findings. Two to three years after publication, articles that are cited elsewhere and show evidence of being important are mentioned in the *Annual Review of Psychology* or other reviews. This mention marks their acceptance as part of the pool of recognized knowledge.

3. *The information system of psychology*—the authors emphasize the different functions of formal and informal information transfer in psychology.

(a) Informal. The informal system encourages the free flow of ideas in abstracted, colloquial, incomplete, or vague form. The authors consider the working paper or technical report of particular importance for two reasons. First it often gives the most detailed account of procedures, instruments, etc. Second, because it is informal, this kind of paper permits the researcher to speculate and theorize more than does a published article. It also allows experienced researchers to keep up; their own judgment protects them against "unreliable" information.

(b) Formal. The formal transfer system, on the other hand, serves to monitor and filter information, to make sure of its quality before including it in the body of commonly recognized knowledge. The authors note that the long process of judgment is unique to science and should not be accelerated for the sake of improving communication. Rather the informal communications system should be recognized as the means by which current advances are disseminated; it should therefore not be formalized or streamlined by information systems designers who do not recognize its true function.

96

RESEARCH UTILIZATION: MEDICAL

Utilization deterrents
Adoption process
Dissemination measures

EMPIRICAL STUDY

Glaser, Edward M. *A pilot study to determine the feasibility of promoting the use of a systematized care program for patients with chronic obstructive pulmonary disease.* Los Angeles: Human Interaction Research Institute, final report to Social and Rehabilitation Service, Department of Health, Education, and Welfare, project RD-2571-G-67, July 1968.

Purpose

In recent years some exercise programs have been developed which, when used in conjunction with other appropriate treatment of patients suffering from chronic airway obstruction, appear to hold promise of contributing significant help. Yet, these exercises, as part of a comprehensive systematized care program, are not widely used, despite many publications in the medical literature citing evidence of their potential value.

The purposes of this study were:

1. To determine the methods, facilities, and programs currently (1968) used throughout the country for the diagnosis, medical treatment, management, and rehabilitation of patients with chronic obstructive pulmonary disease (COPD).

2. To make site visits to several of the best known comprehensive treatment centers for COPD which have published promising results from inclusion of exercise programs.

3. To compare programs and try to arrive at a consensus (at a conference of leaders from several disciplines involved in the treatment of patients with COPD) regarding an optimally effective and widely applicable diagnostic, treatment, and re-

habilitation schema incorporating the best features of existing programs.

4. To identify systematized care modalities which appeared to require further study or cross-validation.

5. To develop strategies for further research into other important unresolved questions in connection with diagnosis and treatment of COPD. Such research would involve both physicians in private practice and systematized care teams in medical centers.

6. To develop and carry out plans for promoting dissemination, utilization, and continuing evaluation of the refined and validated systematized care program which should be developed as an outgrowth of the preceding objectives.

Method

The methodological steps designed to achieve the purposes were:

1. To determine current practice through questionnaire, literature review, and selected site visits. The questionnaire was mailed to 1,320 physicians—members of the American College of Chest Physicians who indicated a specialty of pulmonary disease.

2. To invite outstanding specialists engaged in the study and treatment of patients with COPD—including chest physicians, pulmonary physiologists, thoracic surgeons, nurse specialists, physiatrists, physical therapists, psychiatrists, psychologists, and rehabilitation counselors—to a conference where they could discuss and compare programs, and try to arrive at consensus regarding an optimum systematized care program.

3. To develop with the conferees planned strategies for further exploration, research tryout and cross-validation of the agreed-upon systematized care program, as well as plan research into other important unresolved questions.

Findings and Conclusions

1. Of the 1,320 persons to whom the questionnaire was sent, 307 or 23 percent responded. They provided information regarding facilities and programs they were using for the diagnosis, treatment, management, and rehabilitation of patients with COPD. (Detailed information and discussion are contained in the report.)

2. The conference achieved general agreement concerning principles for the management of patients with COPD and, in that sense, also made progress in research utilization. The use of breathing retraining, postural drainage, relaxation exercises, and graded conditioning exercises—the underutilized physical medicine techniques which had originally motivated this inquiry—was supported. Many of these treatment programs never before had been described and published in detail. There was unanimous agreement that proper treatment may relieve or lessen symptoms and improve a patient's ability to function independently. To be optimally effective, however, the program should provide patient and family education, home follow-up, and vocational rehabilitation when needed.

3. The conferees also achieved a sharper identification of important unresolved questions that need further experimental study, and they expressed willingness to collaborate in the future to seek further knowledge with regard to those questions. This represented another outcome to facilitate research utilization.

4. A valuable interdisciplinary network of communication regarding diagnosis and treatment of COPD was developed or strengthened in connection with the conference (attended by 49 persons). The communication network was further strengthened through fairly wide distribution of the final report of this pilot study, which constituted still another outcome in the direction of facilitating information spread about promising treatment methods for COPD.

5. A number of deterrents to the utilization of the recommended systematized care program were identified; e.g.:

(a) The need for answers to a number of still unresolved questions such as relative contribution of various treatment components to patient improvement, methods for evaluating the results of treatment, methods of patient selection, significance of home care follow-up, etc.

(b) Practical considerations, such as time required for treatment, necessary facilities, and personnel, need for continuing physician training, adequacy of dissemination of information, etc.

(c) Attitudinal deterrents, such as inertia, threat to status, need to learn new skills, etc.

97

RESEARCH UTILIZATION
Planned change
Innovation characteristics
Dissemination factors

REVIEW OF LITERATURE

Glaser, E. M. Knowledge transfer and institutional change. *Professional Psychology*, 1973, 4, 434-444.

Purpose

1. To offer illustrative evidence for the observation by former HEW Secretary Richardson and others that too much R&D money "has gone into poorly conceived projects, too few of the results have been rigorously assessed and our means for disseminating the worthwhile results have been too feeble."

2. To submit that the problem of transferring knowledge from R&D settings to other persons and places is not just a matter of coherently synthesizing the findings or providing easier-to-use information storage and retrieval arrangements. Rather, it involves a more complex *human problem* of how to get organizations, institutions and individual decision makers to develop a climate of nondefensive, open-minded willingness to review their standard practices and become receptive to change that may be required for the adoption of given promising innovative procedures or policies.

3. To spell out the factors specifically related to successful transfer of R&D findings.

Method

Glaser reviews relevant literature to support his analysis of the factors related to successful transfer of R&D findings, and provides a chart summarizing some ways of enhancing utilization potential in designing and carrying out research, beginning with writing the proposal, negotiating the grant or contract, carrying out the project, writing the final report, and (if warranted) carrying out postproject cross-validation, replication and diffusion activities.

Findings and Conclusions

With the advent of revenue sharing, there has come into being a new partnership between the federal government and the states and localities. A role of the federal government will be to assist state and local governments to develop their capacity to assess and assimilate scientific knowledge addressed to domestic needs. Thus, knowledge transfer and institutional change become increasingly important objectives.

The probability of successful transfer of existing knowledge to a new setting depends in part upon the following factors:

1. *Characteristics of the innovation*—Glaser describes seven attributes subsumed under the acronym CORRECT: Credibility, Observability, Relevance, Relative advantage over existing practice, Ease in understanding and installation, Compatibility, and Trialability.

2. *Characteristics of the potential user and the setting*—the leadership style should be one that is open to challenge, facilitates communication, provides for review of goals, respects staff competence, and rewards innovative efforts. The organization must have a capable staff and have access to necessary resources. Those directing change must be sensitive to context: e.g., clients, public opinion, governmental control. Organizational leaders must be skilled in working through resistance to change.

3. *Manner and extent of dissemination*—the author concludes that "a main finding that emerges from this group of studies [namely, the ones he has reported] is that the greatest *single* means that can be used to increase information utilization may be personal interaction (at least in some fields), and the strategic contact is the well-informed colleague ('gate-keeper')." Other means, such as effective written communication of information (e.g., journal articles, reports, manuals, books) also are needed.

4. *Facilitating forces*—among the interactive forces which bear upon achieving planned change are: leadership openness to new ideas; outside pressures for change; information-feedback that kindles desire to change; aroused will of key figures, such as in response to perceived crises; an incentive system that provides rewards for appropriate changes or types of behavior; structural re-

organization or organizational rearrangement; stimulation of shared interest in learning about how to solve given problems; sufficient resources; and loss of enthusiasm or commitment which leads to increased readiness for a change that promises something better.

Two examples of careful planning for R&D transfer are provided.

98

RESEARCH UTILIZATION: REHABILITATION

Innovation
Dissemination of information
Consultation measures

CASE STUDY

Glaser, E. M., Coffey, H. S., Marks, J. B , and Sarason, I. B. *Utilization of applicable research and demonstration results.* Los Angeles: Human Interaction Research Institute, 1967.

Purpose

The purpose of this project was to study the factors which impede and those which facilitate the spread of innovation in the vocational rehabilitation field; to develop and apply experimentally strategies for overcoming barriers which block initiation and adoption of innovation; and to formulate a range of strategies intended to stimulate innovation.

Method

The investigators selected (with the concurrence of VRA) a project of Tacoma Goodwill Industries as the subject of this study. The Tacoma project demonstrated the feasibility of rehabilitating severely retarded young adults to the level of sustained employment. It was hypothesized that more widespread adoption and/or adaption of this relatively effective program might be stimulated by new techniques of disseminating information concerning the project to potential users and by providing psychological consultation to the management staff of potential user agencies. The information techniques that were tested were: (1) a brief, readable booklet describing the project; (2) a conference to facilitate an interchange of points of view and experiences related to the project; (3) the dispatching of an experienced spokesman for the demonstration project to provide on-site consultation to potential user agencies. Psychological consultation was provided to five sheltered workshops which were perceived as potential users of a program comparable to the Tacoma project, with five comparable workshops serving as controls. A number of instruments were designed to assess the impact of these strategies; these were augmented by informal and anecdotal feedback.

Findings and Conclusions

1. The chances of impact are increased if promising research or demonstration findings are reported in readable, brief, and nontechnical form and are widely distributed to potential users, but this form of information dissemination does not produce as pronounced an effect as had been anticipated. Its impact is greatest where interest has already been established.

2. The study clearly demonstrated that if potential users attend a conference where they can discuss an innovation and see it in operation, adoption of the innovation will be significantly facilitated.

3. Potential users who had received the nontechnical report and had participated in the site visit/conference were not additionally stimulated, to an appreciable amount, by a "missionary" visit from a representative of the Tacoma project.

4. Psychological consultation to management of sheltered workshops helped those organizations change more rapidly than the control group and made them more receptive to innovation.

5. Beyond the foregoing findings, which stemmed directly from the experimental work carried on in the project being reported, the investigators formulated a number of strategies for adoption of inno-

vation in vocational rehabilitation. Among the highlights are the following:

(a) Innovation does not spread automatically. It tends to be impeded by barriers, both in the processes of communication and in the attitudes of the people and organizations who can be considered potential users.
(b) Communications concerning innovations should be credible and stimulating. These communications should be a factor in the initial planning of a research project, and should be provided for, in terms of budget and time.
(c) Potential users of the findings of a research project should be invited to participate in the planning of the project.
(d) Since there is evidence that personal contact with innovators may be a crucial condition for the optimal dissemination of new ideas, it might be productive strategy for innovators of successful projects to meet with others in the same and related fields by means of special regional or national meetings.
(e) Tandem teams consisting of a rehabilitation expert and a psychological consultant to management might effectively serve as change agents in the vocational rehabilitation field.

99

INNOVATION ADOPTION
Innovation: mental health
Adoption deterrents
Dissemination strategies

EXPERIMENTAL STUDY

Glaser, E.M., and Ross, H. L. *Increasing the utilization of applied research results.* Final report to National Institute of Mental Health, Grant No. 5 R12-MH-09250-02. Los Angeles, Calif.: Human Interaction Research Institute, 1971.

Purpose

This study undertook to investigate what deters organizations from putting promising innovations into practice; to apply and test various strategies which are designed to make these organizations (and their professional leaders) more willing to accept a specific innovation; and (as an outgrowth of the findings of the foregoing) to explore the psychological, sociological, economic, and institutional forces which inhibit or facilitate change.

Method

The specific innovation selected for the experimental phase of the study was saturation group therapy (SGT), a format for the delivery of psychotherapy in a prolonged series of weekend group treatment sessions. The innovation selected met the following criteria: was potentially useful to a broad spectrum of mental health agencies and applicable to certain categories of patients; was replicable without excessive financial costs or unique skills; presented discernible difficulties in implementation; was credible to agency decision makers; was in current operation so that it could be observed in action.

Major categories of users of this treatment modality in the country were identified and assigned to either experimental (80 percent) or control (20 percent) status; total N = 1,770.

The dissemination strategies employed were: a descriptive pamphlet related to SGT; a consultation visit to the user agency by the director of SGT; a visit and conference at the site at which SGT was an ongoing demonstration project; a consultation from the SGT director to agencies *after* their representatives had taken part in a site visit.

All organizations in the experimental group and half in the control group were first sent the pamphlet. Organizations which then participated in further dissemination efforts were self-selected. A series of questionnaires, dispatched at appropriate times in the course of the study, undertook to assess the respondents' changing levels of awareness of SGT, their attitudes toward it and toward adoption or adaptation of this innovation at their

agencies. These findings served as measurements of the relative impact of the techniques being tested.

To gain additional insight into the underlying attitudes and patterns of the target organizations with regard to innovation, open-ended interviews were conducted with personnel at 33 such agencies.

Findings and Conclusions

1. Despite the extensive dissemination efforts, the number of adoptions or adaptations was surprisingly small, although there was evidence that agency decision makers increased their understanding of SGT, and, in some instances, developed hospitable attitudes toward its use. This finding suggested that the practical barriers (money, personnel, facilities) to adoption of SGT overshadowed intellectual acceptance of it.

2. Findings with respect to the specific dissemination techniques were as follows:

(a) The pamphlet (when the recipient was alerted by an accompanying questionnaire) provided a basis for forming a general inclination or set for or against SGT; it stimulated intellectual interest, but did little more.

(b) The consultation visits were informative, clarified some issues, but did not dissipate the participants' doubts about the feasibility of implementing SGT in their agencies.

(c) The site visit and conference stimulated enough enthusiasm among most participants to create specific advocacy for SGT; participants returned to their home agencies willing to search for ways to overcome economic and organizational barriers; they were, however, in most instances unable to transmit their positive feelings to their coworkers.

(d) The postsite visit consultation had a booster effect on agency interest but was not sufficient to overcome what the agency perceived as barriers to implementation.

3. The investigators hypothesized that resistance to adoption of SGT, despite intensive dissemination strategies, was related, in part, to characteristics of the innovation itself. The innovation was assessed in terms of criteria identified by earlier studies of innovation, and it was determined that potential users of SGT perceived it as having limited relevance, a high potential for incompatibility, dubious relative advantage, a high degree of complexity, and potential difficulties with regard to reversibility, divisibility, trialability, and credibility. The extent of these difficulties was underestimated when the project was selected.

4. In assessing factors which have a bearing on an agency's willingness to innovate, the investigators suggested that innovative agencies tend to be those characterized by high morale; a practice of autocritical review of mission and performance thereof; staff participation in decision making; responsiveness to community needs; staff rewards based on performance rather than status; and a minimum of arbitrary supervision. In the less innovative agencies, there is likely to be strong centralization and hierarchical control; lack of awareness of agency mission; hostility engendered by a staff/administration power struggle; rigid commitment to orthodoxies (either individual or shared).

5. On the assumption that willingness to change is not sufficient without organizational means, the investigators formulated a set of operating conditions which would provide an organizational vehicle for effecting change. These conditions are: instituting regular mission review; assessing program effectiveness; disseminating knowledge about alternative practices; providing opportunity for advocacy; providing a means for making decisions; providing a way of sustaining commitment; and having control over sufficient resources.

6. Finally, the investigators reevaluated the dissemination strategies which had been utilized in the experimental phases of the project being reported, and recommended certain refinement in future efforts to promote utilization. Significant among these refinements are: (a) more careful screening of innovations to be disseminated; (b) fuller involvement of potential users toward this end; (c) more careful selection of target agencies to be recipients of dissemination efforts, with particular attention to willingness and capacity to innovate.

100

RESEARCH UTILIZATION: MENTAL HEALTH
Utilization factors
Utilization measures

EMPIRICAL STUDY

Glaser, E. M., and Taylor, S. *Factors influencing the success of applied research.* Washington, D.C.: National Institute of Mental Health, Department of Health, Education, and Welfare, final report on contract No. 43-67-1365, January 1969.

Purpose

Five successful and five less successful applied research projects that had been carried out through grants from the National Institute of Mental Health were studied by the Human Interaction Research Institute of Los Angeles in an effort to identify and document some of the factors which promote or impede—

1. the effective conduct of a project; and
2. the achievement of project objectives, including the production of clear, cogent, useful results which are adequately disseminated to potential users.

This study was requested by the Applied Research Branch of NIMH in order to obtain information which might be useful in improving—

1. the selection of projects for funding; and
2. NIMH consultation with grantees.

Method

In order to gain insight regarding the process of applied research, the life cycle of a project was conceived as being divided into six stages: idea, design, funding, research, development and dissemination of findings, utilization.

Principal investigators, administrators, and practitioner-utilizers were interviewed in a climate of confidentiality and frankness in an effort to obtain the benefit of their unique perspectives regarding what happened during the life cycle of their respective applied research projects.

Findings and Conclusions

1. *Characteristics of the Successful Project.*

(a) The successful project was characterized by high communication awareness and involvement with persons and groups within and outside the immediate environment from its earliest moments. The project staff made efforts to induce interest and cooperation from a wide group of supporters and potential users. Interaction and communication proceeded at a high rate through both formal and informal channels. Potential obstacles were shared concerns. The resolution processes often provided unanticipated benefit and strengthened the project. The development and maintenance of a network of communication took time and effort, but observable rewards justified the expenditure.

(b) The research was designed by the principal investigator, who devoted full time to the project. The host agency indicated its commitment by contributions of services and supplementary funds. The focus of the research was aimed at a felt need which enjoyed a shared interest from other people. Ipso facto, therefore, the product was readily marketable. Potential consumers were involved and informed. They encouraged early efforts at dissemination of findings, and were ready to consider implications for utilization.

(c) Throughout the life of the project there was ample evidence of adequate project structure (i.e., committees, liaison, linkage). There was leadership capability, with a consensus among those involved regarding priority of goals. Dissemination was planned for, and a higher level of utilization was achieved. The communication component paid off again and again: when severe problems were encountered by successful projects, their base of involved supporters was sufficient to cope with the problems.

2. *Characteristics of the Less Successful Project.*

(a) While there was some interaction and internal communication, there was little sustained effort to open up the process to others.

Communication was sporadic and involvement was limited to a small nucleus. The problem to be investigated may well have appealed to a constituency of interactors, but involvement was not welcomed. In fact, there was a pervasive and discernible quality of insularity. Administrators and practitioners resented being excluded.

(b) Characterized by calm during the idea, design, and funding stages (in contrast to the successful projects which were dynamic and laden with conflict), these projects erupted soon after the research stage began. Problems developed suddenly and often were unanticipated. Coping efforts were hindered by the fact that part-time principal investigators did not have the time to devote to resolution efforts. Nor did they have an invested group of supporters to help and share responsibility. Each problem reverberated throughout the project, causing extensive shock. Plans were delayed or abandoned en route. Despite the problems, there were successful findings worth reporting, but there was insufficient time for reports and little "push" comparable to the encouragement received by successful projects.

RECOMMENDATIONS

1. Applied research projects should energetically seek the reactions and contributions of potential users, including both practitioners and administrators, from the idea stage through to the completion of the research.

2. Whenever feasible, formal boards or special committees should be formed to serve as responsible advisers to research projects.

3. The original research questions, subsequent design and communication of progress or findings should incorporate issues that are of concern and interest to the agency personnel who will be cooperating with or assisting the project.

4. The principal investigator should have either written the research proposal or be intimately familiar with all of its various aspects.

5. From the beginning, effort should be made to develop a network of communication with others who may be interested in or of help to the research in order to build widespread awareness and appropriate involvement.

6. The process of seeking funds should be a relatively open and shared experience, in order to benefit from the suggestions of other people, and to insure that the budget will be realistic.

7. Contributions of staff time and other services by agencies should be thoroughly discussed with the parties who will be asked to provide the assistance.

8. A written agreement outlining reciprocal responsibilities in sufficient detail to assure that there is a meeting of minds between the research team and the agency should be developed before the research begins.

9. The consultative services of funding organizations should (if available) be utilized prior to submitting applications for support.

10. Site visits by funding agency staff to potential grant recipients should occur wherever possible, and should include some interaction with middle-level supervision and practitioners who will be working with the research project.

11. Pilot projects or reconnaissance phases should take place before the major commitments of time and money are made. Ideally, this would allow sufficient time for evaluation of the initial results and provide a realistic assessment of needs and potential problems.

12. If problems develop during the conduct of the research, every effort should be made to open two-way communication with the entire project staff and perhaps with added inputs from appropriate outside consultants, so that the project can benefit from the suggestions and reactions of all who are legitimately concerned.

13. Principal investigators should devote full or at least a major portion of their time to the research so they can: (a) maintain an effective communication network; (b) work to maintain linkage with the system; (c) have time available to work through solutions to problems.

14. Potential consumer groups should be informed concerning promising findings, through site visits, special institutes and reports which are focused on the needs of service settings.

15. Before the final research findings are reported, progress reports, discussion drafts, and other means should be utilized to seek feedback from a sample of potential users.

16. Wherever the staff of an agency contributes to data collection of other research activities, special efforts should be made to involve them in the study, and repay their investment by discussing the research findings in person, as well as by issuing reports.

17. Members of the several professional disciplines represented on the research team should be encouraged to publish and report to their colleagues since this facilitates interpretation to a wide

audience of potential consumers.

18. Workshops and institutes should be scheduled before journal publication, since this serves to sharpen the focus of findings on implications for practice.

19. Administrators and practitioners, as well as researchers, should consider possible means for utilizing valuable research findings long before the project terminates.

20. Sufficient time, money, and skill should be allocated to dissemination and utilization, rather than leaving it to chance or to meager funds left over as the project draws to a close.

21. Funding organizations should develop a staff of consultants who can work with project personnel with respect to dissemination and utilization matters long before the project ends and staff scatters. Projects with a large number of potential users should have a dissemination and utilization expert available through the life of the project, either as a full-time staff member or a consultant, to plan and implement the foregoing functions.

22. A retrieval system should be developed by funding agencies to recover and disseminate research information which might not otherwise reach potential users.

23. Each regional office of Federal funding agencies should be staffed with a person primarily responsible for applied research; who will be in close communication with the central office and can: consult with projects as a knowledgeable helper; keep abreast of relevant research in the given field (such as mental health services delivery) throughout the country; share this information with project personnel; stimulate dissemination and utilization efforts; and in general serve as a knowledge utilization specialist.

101

RESEARCH UTILIZATION
Research-practitioner relationships
Research grant procedures
Inter-agency cooperation

SEMINAR REPORT

Glaser, E. M., and Wrenn, C. G. *Putting research, experimental, and demonstration findings to use.* Washington, D.C.: Office of Manpower Policy, Evaluation and Research, U.S. Department of Labor, 1966.

Purpose

This report seeks to pinpoint ways in which funding agencies can contribute to closing the gap between new knowledge and everyday practice.

Method

Representatives of a number of governmental agencies (and a few nongovernmental organizations) met in a 2-day seminar in Washington. Format for the seminar had been determined by a planning committee conference involving 15 participants. Seminar attendants selected topics on which they wanted primary focus and discussed these topics extensively in small groups. Conclusions and recommendations emerging from those discussions constitute the content of the report. Draft of the report was circulated among participants for comment and revision, and final report represents consensus derived from this editorial collaboration.

Findings and Conclusions

1. *Stimulating Good Proposal Ideas.*

(a) Rather than insist on a full-scale proposal, solicit an early, informal letter describing essence of proposal. Hence potential researcher can get initial response from funding agency without large investment.

(b) Offer a small subsidy for preparation of detailed proposal; this might make it feasible for persons to think about needed R&D and E&D projects who could not otherwise invest the time.

(c) Prepare subject matter reviews of the state of

the art to help disseminate already existing knowledge and aid in guiding potential researchers to undertake quests that will fill significant gaps (that is, projects for which ultimate utilization will be more likely).

2. *Improving the Grant or Contract Negotiation Procedure to Achieve More Effective Utilization.*

(a) Require that formal proposals include explicit statements regarding plans for utilization (desired impact, target audience, strategies for dissemination, etc.).
(b) Clarify criteria for accepting proposals.*
(c) Make clear the function of advisory panels and review committees.*
(d) Encourage the parallel exploration of alternative design studies and/or pilot approaches to a complex problem.
(e) Involve outside consultants on the problem of designing projects suitable for ultimate utilization.

3. *Improving the Interaction Between Funder and Grantee or Contractor.*

(a) The grantor agency should be appropriately staffed so that it can maintain a close relationship with the grantee in order to increase eventual utilization (site visits, technical assistance, improved funding arrangements, conferences or workshops of potential users, etc.).
(b) Requirements for reporting should be supportive of ultimate goals of dissemination and utilization.

4. *Clarifying the Kinds of Actions That Might Result From E&D Project Findings.*

(a) An E&D project might have as a legitimate objective one or more of the following kinds of changes: spread of a new technique to other comparable settings; continuation of demonstration project on more permanent basis; spinoff or acceptance by ongoing agency other than original funder; spillover in which demonstration acts as catalyst for change rather than generates direct and explicit adoption.
(b) Among the effective strategies for getting change accepted in an institutional setting are: setting up a demonstration within the institution in the hope that exposure will win converts; setting up the project in a new and thus competing institution, thereby exerting "gadfly" pressure; invoking outside pressure (such as organized citizen pressure) for change.
(c) Change will be accepted in direct proportion to the extent to which potential users recognize that their self-interest is advanced by the change.

5. *Translating Findings Into Action.*

(a) Potential users should be identified at the outset and should be invited to function as consultants and coarchitects throughout the research and/or demonstration phase of the project.
(b) Credible and competent evaluation of findings should precede intensive effort for wide utilization.
(c) More research is needed to determine what kinds of projects have the best change of user impact—and why.
(d) Among the strategies that promote the movement of findings into action are: availability of well-written, credible reports; discriminating dissemination of reports; person-to-person transmission of findings through conferences, site visits, seminars, etc.; use of human link (change-agent)--between innovator and potential user; use of mobile teams of resource persons and change consultants to stimulate innovation; strengthening credibility of initial demonstration through replication, reiteration, and reaffirmation.

6. *Training of Washington E&D and R&D Program Staffs*—a range of skills are suggested as requisite for program staff of funding agency if that staff is to work effectively with grantee staff to maximize dissemination and utilization. These include subject matter knowledge, competence in social sciences and/or business administration, understanding of research methodology, capacity to function as disseminator, ability to cope constructively with conflict.

7. *Developing Better Interagency Coordination in Investigating Given Problem Areas*—because many funding agencies work in common or overlapping subject matter areas and because all share the objective of getting the best utilization payoff for their research investment, the following coordination strategies were advanced:

(a) Establish interagency project review committee.
(b) Establish joint priorities and consider need for replication of demonstrations.
(c) Establish data retrieval system.

*Only tangentially related to utilization.

(d) Conduct subject matter conferences.

As an extension of the recommendation for interagency coordination, the seminar suggested a number of follow-up steps which would preserve and strengthen the interchange achieved during the seminar: expanding the participating group for subsequent seminars, creating an annual conference on utilization, interchange of utilization case studies, etc.

102

RESEARCH UTILIZATION: SOCIAL
Utilization factors

CASE ANALYSIS

Glock, Charles Y. Applied social research: Some conditions affecting its utilization. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science*, vol. 1. Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 1-19.

Purpose

To identify the conditions under which maximum utilization of social research occurs—more specifically, to distill from the available evidence some of the principles that determine whether or not applied social research, once commissioned and executed, is used.

Method

The evidence is drawn from the experience of the Bureau of Applied Social Research, Columbia University (where the author has served as director) and from case studies of other research organizations known to the author. All case studies cited were situations in which the client (that is, the user of the research findings) has specifically requested that the research be carried out—in other words, these were problems in search of solutions.

Findings and Conclusions

1. *Nature of the Problem.*

(a) Research is most often commissioned to serve one or more of three functions: to evaluate, to diagnose, to prescribe. Social research is most suitable for answering evaluative questions; the client's motivation for commission research is usually to get prescriptive aid. Accordingly, the best research on an evaluative problem is likely to be less useful to a client than relatively inadequate research on a prescriptive problem.

(b) Research tends to be usable when it identifies variables which are inherently controllable and where the client organization has the necessary manipulative power to exert that control.

2. *The Role of the Client.*

Since all case material in this study is based on clients who commissioned the research projects, it might be assumed that they were uniformly predisposed to utilize the findings. However, the following significant variables were identified:

(a) Those organizations with a long record of research activity and with a research unit highly integrated into their operations were most likely to apply the findings of social research.

(b) Applied research is most effectively used where the decision to use it is made at the top policy-making level; where there is interested and committed top management which encourages imaginative use of research throughout the organization; and where the organization is flexible enough to modify its procedures to accommodate the innovation.

3. *The Role of the Research Organization.*

(a) A favorable environment for maximal utilization is likely to exist where the interests of the research organization parallel those of the sponsor (this occurs most frequently when the research has a humanitarian content).

(b) Certain ethical problems are sometimes relevant to utilization: there may be a discrepancy between the client's image of the ulti-

mate utility of the research findings and their actual potential utility; some compromise in research standards may be called for to accommodate to the client's administrative constraints; researchers are sometimes under pressure to interpret findings beyond what the data allow.

(c) The research organization's competence has a direct bearing on the utility of the research it produces. Independent research organizations have a high degree of technical competence; on the other hand, research activity that is incorporated in the structure of the client organization has the benefit of accumulated experience in the specific subject matter area. The latter arrangement is probably conducive to maximal utilization.

4. *Interaction between Client and Research Organization.*

(a) For optimum interaction (in terms not only of using the research, but also of formulating it and conducting it), the client organization should be represented by its policymaker and a qualified research technician; the research organization by its chief executive and the project director.

(b) Interaction should, ideally, serve those communicative functions: to clarify the practical objectives of the research, to establish a research design well suited to satisfying these objectives, to monitor the research while it is in process, to identify the applied implications of the findings, to settle administrative and financial arrangements. (In point of fact, interaction rarely covers all these points.)

(c) The more frequent the interaction, the better the outlook for utilization.

5. *The Research Process.*

(a) Studies that are directed at testing a set of clearly stated propositions are more likely to be used than those which are principally concerned with compiling information.

(b) A research study that is comprehensive (incorporates all variables) and that is carried out with a high level of technical proficiency has an enhanced prospect for utilization.

6. *Conclusions.*

(a) There is need for a middleman who is trained in the method of research and the art of utilization.

(b) Thre is need for wider circulation of relevant case studies.

(c) There is need to know more about the applied functions that social research can and connot serve.

103

RESEARCH UTILIZATION: REHABILITATION

Dissemination factors
Research utilization models

EMPIRICAL STUDY

Goldin, G. J., Margolin, K. N., and Stotsky, B. A. The utilization of rehabilitation research: Concepts, principles, and research. *Northeastern Studies in Vocational Rehabilitation*, 1969, No. 6.

Purpose

The purpose of this monograph is to report the ideas and findings of the New England Rehabilitation Research Institute developed through efforts to achieve utilization of its own research results in the core area of motivation and dependency. The authors also present their own systems model of the utilization process.

Method

The principles and concepts discussed in the monograph are based upon a brief review of relevant literature, the experiences of the authors, and the research and observations of the New England Rehabilitation Research Institute.

The specific utilization research reported in the monograph consisted of a readership survey on the

use of two previously published monographs. The Institute mailed 1,000 questionnaires regarding each of the two monographs. The results are based on a 25.4-percent return of one or both questionnaires. The questions related to the respondents' impressions of the monographs, their specific use of them, and if and how the monographs stimulated the readers' thinking.

Findings and Conclusions

1. The results of the readership study indicated that the major uses of the two publications were for a background or literature survey, in preparing a talk or paper, or as part of in-service training. The documents were least used for preparing a research design or proposal, in clinical practice, in administrative planning, and in social or community planning. The particular use made of the monograph was directly related to the professional setting of the reader. The authors observe that there is a need for increased training and motivation in the utilization of research for professionals at the counseling agency level, especially in the area of clinical practice.

2. Of the readers who returned questionnaires, 52 percent stated that they had read all of the first monograph, while 35 percent had read the other document in its entirety. The authors suggest that increased practical use can be achieved in the utilization of such monographs if the implications of the research results are very clearly stated, with some clinical applications spelled out and specific programs for rehabilitation are suggested. Also, results might be more widely used if the implications of the research were woven throughout the monograph. Moreover, research publications must compete with a wide variety of other documents for the attention of potential readers; hence, consideration needs to be given to the development of an attractive cover and format, and material should be written in such a way so as to capture the reader's interest in the publication in the first few pages.

3. The monograph treats research utilization as a psychosocial process involving a dynamic interaction of four major subsystems. The process through which needs are satisfied and the problems become resolved can be seen as taking place through the occurrence of a sequence of acts that transpire as a part of a specific system. The efficiency and the effectiveness with which the utilization subsystems operate is determined largely by the level and quality of communication that can be developed within and between these subsystems.

(a) *The information-education system*—the function of this system is the production and transmission of knowledge. Whether or not this system acts autonomously or in interaction with the other utilization subsystems depends upon the existence of a felt need for change in the area to which the particular knowledge developed through the research is concerned. For optimum functioning of this subsystem in the process of research utilization, researchers need to be instilled with a "utilization mindedness" so that they will become concerned with building utilization potential into the research design at the outset of the research.

(b) *The diffusion system*—this system must challenge existing norms and values of the social system upon which it is acting at a given time.

(c) *The change system*—the change system differs from the diffusion system in that it involves the conscious and planned use of a mediating force, which serves to mediate between the agencies of the information-education system and the targets of change.

(d) *The action system*—this system is concerned with the mobilization of broad-scale financial support for the promotion of utilization, and involves the setting up of practical steps to be taken to spread the adoption of innovation and change.

4. Within the structure of the above subsystems, research utilization occurs as a result of five contiguous phases: results dissemination, information reception, conceptual comprehension, psychosocial acceptance, and internalized assimilation. Complete utilization occurs only when individuals perform in the innovated manner without much thought or consideration of the new procedure or idea.

5. Dissemination of results needs to consider both scope and selectivity, in order to encompass the possibility of attracting the less likely users and also beaming dissemination outputs to selected individuals who are in the best positions to utilize research. The authors suggest the possibility of developing techniques of aggressive dissemination. Using the concept of aggressive casework as a model, the Institute has experimented with this approach and had encouraging results. The concept of aggressive dissemination involves not only the selection of a target audience of key individuals, but also stimulating the motivation of these individuals to become receptors of the information.

6. Another key variable in research utilization is the clarity and attractiveness with which the research results are written. In promoting information reception and conceptual comprehension the authors have developed a bilevel approach wherein they gear each of their reports to two target audiences, thereby extending the potential readership.

7. Finally, utilization depends upon the extent to which psychological and sociological resistance to change can be overcome. That is, the research results must be emotionally acceptable to the individuals responsible for implementation and socially acceptable to the organization which they affect.

8. The authors draw the broad conclusion that, "maximum utilization of rehabilitation research depends upon the development of a partnership between the researcher and the practitioner and rehabilitation administrator." For this to occur, an internalized rehabilitation research utilization mindedness within the professional value system of the rehabilitation practitioner and administrator is needed.

9. In order to establish this partnership of value systems, the authors offer the following recommendations:

(a) In order to inculcate an orientation to research utilization the rehabilitation practitioner should be expected to review and report on a specified number of (two or three) research studies that have applicability to his work. This would be considered as part of his job description and pointed out to him when he is hired. In other words, an attempt should be made to structure research utilization into the practitioner's professional role.

(b) A national research utilization committee should be created and composed of rehabilitation researchers, practitioners, and administrators in key positions to assist the Social and Rehabilitation Service research utilization branch in an advisory capacity and to stimulate the utilization of rehabilitation research.

(c) Research utilization committees which are counterparts of the National Rehabilitation Research Committee should be organized at the agency level, particularly in the State rehabilitation agency.

(d) The academic training of the rehabilitation researcher should include material on the principles of research utilization with emphasis on the psychosocial aspects of innovation and change.

(e) The advocacy principle should be employed in the utilization of particularly important applications of research findings. For example, organizations such as the National Rehabilitation Association could be instrumental in advocating the adoption of certain innovations which research established as having important value.

(f) A section outlining utilization plans could be included in research proposals or grant applications. While it might not be possible to follow these plans closely following completion of the research, at least guidelines for the use of the particular research would be established.

(g) Rehabilitation Research Institutes, research and training centers, as well as the research departments of State rehabilitation agencies and private rehabilitation agencies, could work on the development of an active consultation program in the utilization of rehabilitation research.

(h) Since face-to-face psychosocial transactions are an important factor in the dissemination, interpretation, and acceptance of research results, the frequency of rehabilitation research utilization conferences should be increased, not only on the national level but on the local level as well.

(i) In research courses, both on the undergraduate and graduate level, increased emphasis should be placed on the writing of research reports with the goal of utilization in view. Thus, such factors as clarity, comprehension, and comprehensiveness would be stressed.

(j) Intelligent consumption of research results requires training and understanding. It is, therefore, recommended that in-service training be designed for rehabilitation practitioners that will focus upon the understanding and application of research results, particularly in the clinical area.

(k) Finally, it is important to emphasize serious consideration of the aggressive or outreach concept in the selective dissemination of research results. There are key practitioners, administrators, and planners in the professional rehabilitation community who would consider the application of research results if these were placed before them but would not mobilize sufficient goal directedness to actively seek out new ideas and the results of research.

104

CHANGE: TECHNOLOGICAL
Evaluative procedures
Value criteria

ANALYSIS

Green, Harold P. Technology assessment and democracy: Uneasy bedfellows. *Business and Society Review,* 1973, 5, 72-80.

Purpose

To consider the need for technological assessment in business and industry and its implications for democracy.

Method

The author presents a speculative analysis of issues relating to technological assessment, with special reference to a congressional proposal in 1968 for a technological assessment board.

Findings and Conclusions

1. Technological assessment is an effort to examine the benefits, costs, and risks of a technology in a vigorous and intensive manner as a step toward determining what, if any, governmental action may be necessary or desirable to direct the development or use (or nondevelopment or nonuse) of the technology along lines that will achieve an optimization of the benefit/cost ratio. The assessors must consider not only the immediate effects but also the second, third, and Kth order effects. The effects must be quantified in terms of being desirable, undesirable, or uncertain.

2. There is difficulty in specifying the results of technological assessment. Some of the principal ways are as follows:

(a) a report by the assessors merely stating the benefits, costs, and risks;
(b) a report which actually balances the benefits against the cost and risks, and states the net result;
(c) a report which discusses various alternative modes of governmental action and assesses each one; and
(d) a report which states what the assessors regard as the optimum government action, or perhaps ranks the various alternatives from the standpoint of the assessor's views.

3. Industry and government always have performed a kind of technology assessment as they make management decisions with respect to technology.

A congressional proposal was made in 1968 asking for a technology assessment board in order to strengthen the role of Congress in making judgments among alternatives for putting science to work for human benefits. The author does not believe that technology assessment should become an institution for Congress.

4. As to the question of who should perform such a technology assessment function, the author suggests that it should be a free agency, not influenced by special interest groups or by the executive branch of government. Also, the assessors must have sufficient prestige for the public to have confidence in their findings and judgments.

5. A number of issues related to the limitations of technology assessment are enumerated:

(a) Can even the most sophisticated, carefully constructed, and properly staffed and administered technology assessment process be *expected* to produce an assessment which is entitled to implementation?
(b) Even assuming that a technology assessment is perfect, is it reasonable to expect, in terms of political realities, that it *will* or *can be* implemented?
(c) Is it consistent with the political theories underlying our form of government to expect or assume that it *should* be implemented?
(d) How are risks and benefits to be evaluated? Risks and benefits are relative to the individuals involved. Ultimately, the assessor will be identifying and quantifying risks and benefits within his own value system or the value system he *believes* prevails in the community.
(e) A benefit cannot be identified or measured in abstract isolation. It must be identified and measured in terms of its cost, and in terms of alternative benefits available at the same cost. How can the full range of alternative benefits even be reflected in a tech-

nology assessment? This really is an aspect of overall national priorities and goals. Whether or how public funds will be spent or to what extent the government will regulate a technology is a *political* question to be resolved through political mechanisms.

(f) Risks are not as obvious or as immediate as benefits. When the technology is new, the identification of potential risks is largely speculative. For example, in 1910 or even 1940 no technological assessment would have identified the risks involved in automobile exhaust fumes.

(g) Assessment, especially in the early stage, likely will show an overweighting of benefits and underweighting of risks, and the general impulse will be to go forward with development of technology. While it is very easy to start up a technology, it is very difficult to make a political decision to turn it off once vested interests have come into being. One of the inherent limitations of technology assessment is that its rational processes may permit or cause harmful technologies to come into existence because of the rational, but politically erroneous, assumption that there will be time to blow the whistle when rational men learn that what initially was an uncertain effect has in fact become undesirable or harmful.

6. Democracy means some errors. The concept of technology assessment was introduced by Congressmen Daddario as a tool for improving the quality of information available to Congress in dealing with scientific and technological issues. Today, some tend to view technology assessment as a means of insuring that "correct" policy decisions are made for science and technology. But in a democratic legislature there is no single paramount objective; rather, there is a set of goals, often mutually inconsistent. The priority attached to each goal varies from time to time, depending on the vagaries of public opinion and of the political process.

7. If viewed as a nearly perfect means of evading and obviating the imperfections of the political process, technology assessment becomes a sham which may actually promote detrimental technological applications. If its limits are recognized, however, this approach can serve as a useful aid to congressional decision makers in their continuing resolution of contending public pressures and interests. It is more important in a democracy that the public have the decisions it wants, rationally or irrationally, right or wrong, than that "correct" decisions be made.

105

RESEARCH UTILIZATION: INDUSTRIAL

Knowledge dissemination
Barriers to utilization

EMPIRICAL STUDY

Greenberg, D. S. Civilian technology: NASA study finds little "spinoff." *Science,* 1967, 157, 1016-1018.

Purpose

To determine the extent to which firms in four industries and a number of vocational-technical schools have been responsive to sources such as the NASA Dissemination Program.

Method

Surveys were made of 62 firms in the electric battery, printing and reproduction, industrial controls, and medical electronics industries and 11 vocational-technical schools. The survey addressed itself to the question as to whether these organizations were seeking to engage directly in the vast outpouring of science and technology that the federal government is underwriting.

Findings and Conclusions

1. Few, if any, of the organizations surveyed yielded an affirmative answer to the above question.

2. The author concludes that little has been

done to simplify the problem of increasing technical awareness of nonspace or nonmilitary manufacturers. Instead, the technologist with a problem is inclined to fall back on the standard manuals and textbooks with which he is already familiar.

3. Government publications are not perceived as major channels for acquiring technological information. The variety and mass of these publications pose great screening and selection problems.

4. Most organizations had one person who values the Official Gazette of the United States Patent Office, but most people expect to learn of government R&D through trade and professional channels. The government centers are not easily used, and so not valued highly.

5. The preferred channels were found to be professional journals and face-to-face contacts, especially conventions and symposia. Highly specific subject-matter conferences were valued most.

6. Since more than one-third of the respondents had taken course work in the previous year, courses were recommended for disseminating—whether directly by having industrial scientists or engineers lecture, or by means of "problem-solving courses that emphasized technology acquisition." Internships for industrial employees in federal laboratories were also suggested.

7. The author's position is expressed in the conclusion that "if the Federal government is concerned about the state of technology in specified industries, it might as well recognize that there are more direct routes to progress than through the collection of droppings from military and space programs."

106

RESEARCHER-PRACTITIONER RELATIONSHIPS

Science and practice
Middleman role

ANALYSIS

Greenwood, Ernest. The practice of science and the science of practice. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 73-82.

Purpose

The author contrasts science and practice and outlines a science-practice relationship that may prove useful in bridging the researcher-practitioner gap.

Method

The ideas in this chapter of the book are based on the broad experience and observations of the author.

Findings and Conclusions

1. The function of science is the description and explanation of nature in all its manifestations, while the function of practice is the achievement of controlled changes in natural relationships by means of procedures that are scientifically based.

2. Distinguishing scientific theory from practice theory, Greenwood states: "Scientific theory consists of laws describing and explaining nature; practice theory consists of principles prescribing ways of controlling nature." The aim of practice is control. The control function of a practice is bound to exert effects upon the patterns of thinking and behaving of the practitioner. The elements of practice are action, individual focus, artistry, and intuition.

3. Greenwood points out the existence of hybrids; the applied-oriented scientist and the theory-oriented practitioner. These individuals are the ones who can join forces in the middle group between science and practice to help achieve a flow of information between the two.

4. "If we are convinced of the potential benefits of the science-practice collaboration, then we must create the social structure with its built-in rewards to foster and promote it. We cannot rely on isolated applied-oriented scientists and theory-oriented practitioners to collaborate on a voluntary, individual, and informal basis."

107

ORGANIZATIONAL CHANGE
Change factors

REVIEW OF LITERATURE

Greiner, Larry E. Patterns of organization change. *Harvard Business Review*, 1967, 45, 119-130.

Purpose

This article, part of a larger study on organizational development, deals with large-scale organizational change—its justification, the processes of problem recognition and problem solving, and recommendations for future action. It attempts to show how a "successful" change differs from an "unsuccessful" one.

Method

The author surveyed studies on organizational change, dividing them into three categories: Five reporting "successful" organizational changes; six showing similar "success" patterns, but containing somewhat less complete information; seven which reveal "less successful" change patterns. The conclusions expressed in this article are drawn from an examination of these 18 studies.

Findings and Conclusions

1. Recently more and more top managements have begun to realize that fragmented changes are seldom effective in stemming the underlying tides of stagnation and complacency that can subtly creep into a profitable and growing organization.

2. Rigid and uncreative attitudes can be recognized in managerial behavior that—

(a) is oriented more to the past than to the future;
(b) recognizes the obligations of ritual more than the challenge of current problems; and,
(c) owes allegiance more to department goals than to overall company objectives.

3. A revolutionary attitude toward change may be necessary to bridge the gap between a dynamic environment and a stagnant organization.

4. Approaches to the introduction of change can be located along a power distribution continuum: those which rely on *unilateral* authority, those which rely on *shared* authority, and those in which authority is *delegated*.

(a) The use of unilateral authority appears in three forms: By decree, assuming that people are highly rational and best motivated by authoritative decisions; by replacement of key persons, assuming that organization problems tend to reside in a few individuals, and that replacing these people will bring about sweeping and basic changes; and by structure, assuming that people behave in close agreement with the structure and technology governing them.
(b) The shared approach takes two forms: Group problem solving, in which problem definition as well as decision making is shared with lower echelons; and group decision making, where problems still tend to be defined unilaterally from above, but lower level groups are usually left free to develop and choose between solutions.
(c) The delegated approach also takes two forms; Case discussion, in which a group leader helps define the problem, but leaves its analysis and solution to individual group members; and T-group sessions, usually confined to top management with the hope that beneficial spillover will result for the rest of the organization. The primary emphasis here is on increasing an individual's self-awareness and sensitivity to group social processes.

5. Successful change patterns generally: spread throughout the organization to include and affect many people; produce positive changes in line and staff attitudes; prompt people to behave more effectively in solving problems and relating to others; result in improved organizational performance. The less successful changes fall short on all these dimensions.

6. Those organizations reporting successful change show distinctly similar patterns in the evolution of change.

7. The most striking overall characteristic of the less successful studies is a lack of consistency—in starting points, in sequence of steps, and in major approaches to the introduction of change. The less successful attempts used approaches which lie closer to the extreme ends of the power distribution continuum, while the more successful projects

tended to use shared authority.

8. The dynamics of successful organizational change may be pictured as follows: pressure on top management — arousal to take action — intervention at the top — reorientation to internal problems — diagnosis of problem areas — recognition of specific problems — invention of new solutions — commitment to new courses of action — experimentation with new solutions — search for results — reinforcement from positive results — acceptance of new practice.

9. In anticipating future change, four positive actions are called for—

(a) revision of egocentric notions that organizational change is heavily dependent on a master blueprint designed and executed in one fell swoop;
(b) abandonment of the idea that organizational change is for "those people downstairs," who are somehow perceived as less intelligent and less productive than "those upstairs;"
(c) reduction of fond attachments for both unilateral and delegated approaches to change;
(d) awareness of the need for managers, consultants, skeptics, and researchers to become less parochial in their viewpoints.

108

ORGANIZATIONAL CHANGE
Change factors

ANALYTICAL MODEL

Griffiths, Daniel E. Administrative theory and change in organizations. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 425-436.

Purpose

The purpose of the paper is to state a theory of administrative change which will account for some of the commonly made observations concerning change in organizations.

Method

The model employed in the formulation of this theory is the system theory. An open system is related to and makes exchanges with its environment—in contrast to a closed system, which does neither. Open systems tend toward a steady state—that is, change is not characteristic of them. It is assumed that an organization is an open system, comprised of human interactions, that maintains a definite boundary. Administration is considered an open subsystem and the environment a suprasystem. On the basis of the foregoing assumptions, the author sets forth a number of propositions (see below).

Findings and Conclusions

1. The major impetus for change in an organization is from the outside.

2. The degree and duration of change is directly proportional to the intensity of the stimulus from the suprasystem.

3. Change in an organization is more probable if the successor to the chief administrator is from outside the organization than if he is from the inside.

4. Living systems respond to continuously increasing stress first by a lag in response, then by an overcompensatory response, and finally by catastrophic collapse of the system.

5. The number of innovations is inversely proportional to the tenure of the chief administrator.

6. The more hierarchical the structure of an organization, the less the possibility of change.

7. When change in an organization does occur, it will tend to occur from the top down, not from the bottom up.

8. The more functional the dynamic interplay of subsystems, the less the change in an organization (or the don't-rock-the-boat phenomenon).

109

PLANNED CHANGE: EDUCATION
Resistance to change
Innovation factors

CASE STUDY-ANALYSIS

Gross, N., Giacquinta, J. B., and Bernstein, M. *Implementing organizational innovations: A sociological analysis of planned educational change.* New York: Basic Books, Inc., 1971.

Purpose

To report the findings that emerged from an intensive study of an educational innovation (the catalytic role model) introduced into an elementary school.

The authors focused on: (1) isolating factors that inhibit and facilitate the implementation phase of planned organizational change, and (2) shedding light on issues of central importance to both students of organizational change and to individuals concerned with the practical problems of introducing and incorporating change into educational and other kinds of organizations.

Method

Review of the literature and analysis of case study.

Findings and Conclusions

1. *Introduction.* According to the authors, the sociological and social psychological literature on planned change places primary emphasis on the ability of a change agent to overcome the initial resistance of organizational members to change. This explanation oversimplifies the problem of accounting for the success or failure of planned organizational change.

2. *The literature on planned organizational change.* This chapter reviews and appraises studies and essays on planned organizational change with special reference to the problem of implementing organizational innovations. Diffusion and adoption studies explain little of what transpires during an organizational innovation and implementation effort. The literature focuses on internal and external organizational conditions existing prior to a planned change effort but gives relatively little attention to the period during which the implementation effort occurs. Most of the literature assumes that members of an organization are initially resistant to change but that this resistance can be overcome. The authors argue that this explanation ignores important considerations about:

(a) "obstacles to which members who are not resistant to change may be exposed when they make efforts to implement innovations;
(b) the possible importance that management, as part of the role set of subordinates, may play in creating or overcoming these obstacles; and
(c) the possibility that members who are not initially resistant to an organizational change may later develop a negative orientation to it."

3. *Research procedures.* This chapter describes the research methods used and the major methodological problems encountered in carrying it out. The authors first present the rationale for using the case study method, describe the circumstances that led to the selection of the school that was the locus of their investigation, and then report the procedures used to get approval for the study and to gain entry into the school. They discuss the field worker's role and how he established rapport with the school faculty. Finally they describe various data-collection techniques used during each of the three phases of field-work and how they dealt with the major methodological problems which arose during each period.

4. *The climate for educational change at Cambire School in November, 1966.* The authors present evidence of "a very positive external and internal climate for change prior to the introduction of the innovation (the catalytic role model)." The school director, the staff, and the parents all seemed committed to the implementation of educational innovations. The school was adequately funded, and the teachers were well paid. The teachers had volunteered to teach at this experimental ghetto school, knowing that it existed to try out new methods. They were thus not initially resistant to change.

Initial research showed, however, that teacher

performance in November, 1966 was basically traditional in nature. Despite new materials and programs, standard subjects were being taught in standard ways.

5. *The degree of implementation of the innovation.* In adopting the "catalytic role model," teachers were supposed to become less directive and more helpful to students, encouraging them to find their own interests and become self-motivated. In May of the following year, the teachers were still behaving, for the most part, in accord with the traditional role model and were devoting very little time to trying to implement the innovation.

The authors present evidence that when efforts were made to conform to the catalytic role model, the staff's performance was of low quality. They conclude that the degree of implementation of the innovation in May was minimal.

6. *Barriers to the implementation of the innovation: obstacles encountered by the teachers.* In this chapter, the authors examined the following major question: what conditions could account for the degree of implementation of the catalytic role model that they observed six months after it had been introduced? Five basic factors were involved in the "minimal implementation" of the innovation:

(a) the teachers' lack of clarity about the innovation,
(b) the teacher's lack of needed capabilities,
(c) the unavailability of required instructional materials,
(d) the incompatibility of organizational arrangements with the innovation, and
(e) the lack of sustained staff motivation.

Furthermore, the findings revealed that the first four factors existed at the outset and persisted throughout the period of attempted implementation. The fifth factor, lack of staff motivation, developed during the period between the announcement of the innovation and the final assessment of its implementation.

7. *Obstacles encountered by teachers: roots of the difficulties.* The authors give a brief history of how the innovation was introduced and then explain why each of the above-mentioned barriers to implementation had occurred. Generalizing, they conclude that the director's strategy for introducing change was deficient in that it failed to (a) bring into the open the various types of difficulties that teachers were likely to encounter in their implementation attempts, and (b) establish and use feedback mechanisms to uncover the barriers that arose during the period of attempted implementation.

8. *Conclusions and implications.* The authors discuss two theoretical implications of the work:

(a) the possibility of the development of resistance after the introduction of an innovation, and
(b) the role of management in the implementation of innovations.

The authors next discuss the research implications of this study:

(a) the questionable assumption of initial resistance to change;
(b) the need for replication studies;
(c) the need for "conditional inquiries," i.e., studies of the different kinds of obstacles to different kinds of innovations; and,
(d) the evaluation of innovations.

Finally, the authors present the practical implications of this study:

(a) Implementation of educational change is a complex process requiring carefully laid plans;
(b) even carefully laid plans will not prevent obstacles to implementation; and
(c) the role of management during implementation is critical to the success or failure of the project.

110

CHANGE PROCESS: EDUCATION
Change research strategies

ANALYTICAL MODEL

Guba, Egon G. Methodological strategies for educational change. Paper presented to the Conference on Strategies for Educational Change, Washington, D.C., November 1965. Summarized in *SEC Newsletter of the Conference on Strategies for Educational Change,* 1965, 1(4), 4.

Purpose

This paper is intended to identify the most effective general strategy for inquiries in the area of educational change, and to illustrate how it might be employed. It argues that controlled experimentation is not necessarily the best strategy for studying this particular area.

Method

Based on an analysis of two general strategies available to investigators who seek to inquire into a given set of phenomena, the author constructs a conceptual paradigm for the change process, by which he justifies the use of one particular strategy in investigating educational change. He then outlines tactics which might be used in pursuing this strategy.

Findings and Conclusions

1. *The Two Possible Strategies for Inquiry Into Educational Change May Be Labeled "Experimental," and "Aexperimental" or "Field study."*

(a) In the experimental strategy the intent of the investigator is to inquire into possibilities, and in the process he utilizes controlled variables which he has selected on an a priori basis.

(b) In the field study strategy the investigator wishes to inquire into actualities, to ask, "What does happen in the real world?" He may be unsure of the variables that are relevant to his problem, and is not interested in studying them in any form except as they occur naturally.

2. *The Two Methods Do Not Produce Comparable Data*—each method complements the other. They differ in their setting, level of control scope, number of variables, treatment conditions, and context.

3. *The Process of Educational Change Involves Four Stages: Research, Development, Diffusion, and Adoption*—each has a particular objective. Whether or not these objectives are met is judged by the application of certain criteria which are different for each stage. Each stage bears a particular relation to the change process.

These facts provide the framework for a formulation of the change process.

4. *The Field Study Approach Best Fits the Investigation of Educational Change Because:*

(a) In the experimental approach the investigator utilizes a few selected variables known to have high relevance. Change research is in its infancy. No generalized systems of variables or theories have emerged. The experimental method is of questionable utility in an area where the general level of sophistication is low.

(b) In the evaluation process the investigator focuses on actualities, on a natural setting, with a low level of control, and a great number of variables. This process fits exactly the conditions described for field study.

5. *Some Tactics Designed to Carry Out the Strategy Are the Following:*

(a) Field study must be conducted within an explicit theoretical or logical framework.

(b) Field study must be approached programmatically because of its complexity and morality; i.e., outline the possible objectives, assume a logical framework or theory, and make a conscious choice of the particular objectives to be followed on the basis of explicit criteria relating to the objectives.

(c) Data collection in field study is characterized by a unique relationship between the investigator and the field. Not dealing with controlled conditions, changes in the experimental conditions are expected. The field investigator attempts to capitalize on such changes; he need not fear that they will destroy the careful balance of experimental controls.

(d) Because of the probabilistic nature of field data, and the impressionistic way that these are gathered, constant replication and recycling are necessary to build confidence in conclusions.
(e) The fact that experimental control is not possible or even necessarily desirable in field study does not mean that the investigator is forced to use just any sample or situation. Purposeful selection is a powerful tool in focusing upon variables of interest to the investigator.
(f) Special techniques of analysis and interpretation need to be developed which are especially suited to the data produced by field studies. Many of these special techniques may be deduced by analogy to similar techniques in related areas.
(g) A most important tactic in planning field studies is to lean more heavily upon logical inference than upon statistical inference.
(h) The investigator should take as much advantage as possible of serendipities, or "natural breaks."
(i) Pathologies can be analyzed to gain insight into natural situations.

111

RESEARCH UTILIZATION: EDUCATION

Diffusion measures
Researcher-practitioner gap
Evaluation types

ANALYTICAL MODEL

Guba, Egon G. Development, diffusion and evaluation. In T. L. Eidell and J. M. Kitchel (Eds.), *Knowledge production and utilization in educational administration.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1968, pp. 37-63.

Purpose

There is a tremendous gap between knowledge production and knowledge utilization that cannot be spanned *either* by the producer or by the utilizer himself, or even by these two acting in concert, at least in the typical situation. New mechanisms and agencies using special techniques are required to perform this bridging gap or linking function. Guba details the phases of the research-utilization continuum, specifying the agency and mechanisms that might bridge the gap between knowledge production and knowledge utilization.

Method

The author has based his analysis on his own knowledge, experiences, and observations.

Findings and Conclusions

1. The theory-practice (research-utilization) continuum contains four phases or processes: Research, development, diffusion, and adoption.

(a) *Research*—the objective of research activities is the advancement of knowledge. It involves depicting, relating, conceptualizing, and testing.
(b) *Development*—development is directed toward identification of operating problems and the formulation of solutions to those problems. It involves depiction, invention, fabrication, and testing. Whereas the researcher tests in order to verify or refute his hypotheses under strictly controlled conditions, the developer is not concerned with controls, but the workings of an innovation in a real situation.
(c) *Diffusion*—diffusion activities are aimed at creating an awareness about new developments and providing opportunities for innovation assessment along whatever dimension practitioners may deem necessary. Diffusion activities center around procedures or methods of bringing a proposed problem solution or invention to the individual who may actually use it in practice. They involve telling,

showing, helping, involving, training, and intervening.

(d) *Adoption*—the basic objective of the adoption process is the adaptation of a development to the local situation and the installation thereof. The adoption phase involves a trial, installation (modification, training, equipping and housing, and organizing), and institutionalization.

2. *Development* is viewed as an activity with which neither the researcher nor the practitioner is capable of coping. In education, the invention function is better managed than the other functions, with fabrication and testing lagging far behind.

3. *Development agencies* are encouraged to assume the responsibility for all of the functions previously outlined.

4. In relation to diffusion, Guba advocates the use of diffusion strategies. Strategy is defined as "an action plan which indicates which adoption techniques should be used when and where and in what combination." The following elements should be considered during strategy development:

(a) *The assumptions concerning the nature of the practitioner who will be exposed to the strategy*—he suggests several ways of viewing the practitioner: as a rational entity, who can be convinced; as an untrained entity who does not know how to perform but who can be taught; as a psychological entity who can be persuaded; as an economic entity who can be compensated or deprived; as a political entity who can be influenced; as an entity in a bureaucratic system who can be compelled; or as a professionally oriented entity who can be obligated.

(b) *The assumptions concerning the end state in which one wishes to leave the practitioner.*

(c) *The assumptions about the nature of the agency or mechanism carrying out the diffusion strategy*—since the final implementation of the strategy depends upon the agent, the strategy must be one appropriate to the agent's circumstances.

(d) *The assumptions concerning the substance of the invention*—how much change is required by the invention: Does it involve substitution, alteration, perturbations and variations, restructuring, or value orientation change?

4. According to Guba the purpose of evaluation should be changed from judgment to decision-making aid. This "new kind" of evaluation is termed emergent evaluation. Borrowing from Stufflebeam he outlines four kinds of evaluation activities: context evaluation, input evaluation, process evaluation, and product evaluation. He argues for a more flexible, less controlled, more realistic scope and more continuity in evaluation.

112

ORGANIZATIONAL CHANGE
Change agent
Organizational climate

CASE STUDY-ANALYSIS

Guest, R. *Organizational change: The effect of successful leadership.* Homewood, Ill.: The Dorsey Press, Inc., and Richard D. Irwin, Inc., 1962.

Purpose

This is an empirical study of the process of change, in attitudes and in the pattern of actions and relationships, which, in the span of three years, measurably altered the performance of a large, complex industrial organization.

Method

The method is descriptive and analytical, focusing on Plant Y's organization; the periods of disintegration, of change, and of ultimate success; and the impact of the plant manager's role in this change process. The book contains a large number of performance indices.

Findings and Conclusions

1. During a three-year period the following occurred in Plant Y:

(a) Plant Y, under the former manager, had been in serious trouble. Not only was its performance poor but expressions of bitter hostility and discouragement were heard at all levels of the organization.
(b) In time these expressions of hostility and discouragement virtually disappeared, and the plant as a production organization appeared to function more efficiently, not only by its own standards but also when compared with six other similar plants.
(c) The change in attitudes and performance followed the introduction of a new manager.

2. The following conditions remained unchanged, which indicated that it was the succession of a new leader which triggered the change:

(a) The incumbents of offices in direct line of authority above the plant level—division manager, group vice-president, operating executive vice-president, and corporation president—remained the same.
(b) The plant itself operated with substantially the same supervisory personnel.
(c) The formal structure of organization (number of levels, chain of command, span of control, and departmental functions) remained unchanged.
(d) The plant continued to produce the same line of products under the same basic conditions of layout and technology.
(e) Plant Y was subject to the same annual model changes and to external market conditions that other similar plants had to face.

3. Guest formulated the following observations from experiences of Plant Y:

(a) *Observation No. 1:* When an organization is a subordinate unit to a larger organization, and when the patterns of internal relationships within the subordinate organization are similar to those linking it to the larger, changes leading to more successful performance within the subordinate organization will take place *after* there has been a change in the pattern of relationships (interactions and sentiments) linking the larger to the subordinate organization.
(b) *Observation No. 2:* The length of time required for an organization to improve its performance results is a function of:
  (1) The size of the organization in terms of the number of individuals.
  (2) The number of specialized services, reporting, and control groups.
  (3) The number of levels in the hierarchy.
  (4) The complexity of technical operations.
  (5) The degree of intensity of personal insecurity and of interpersonal hostility at the outset of the change process.
(c) *Observation No. 3:* For a complex organization to move from one pattern of behavior to another, it is *not* necessary that its formal structure be altered.
(d) *Observation No. 4:* The process of successful change in a hierarchical organization will start and continue to the extent that the members perceive the behavior of superiors, peers, and subordinates to be more in keeping with the norms of behavior in the larger culture.

4. After a review of the theoretical literature on the nature of authority in an organization, Guest makes the following observations about the Plant Y experience that are compatible with what had been said in the cited literature:

(a) The process by which an agent induces subordinates to act in a desired manner varies according to the type of organization being considered. In the present case, the organization had the following characteristics:
  (1) It was created and maintained for the primary purpose of producing goods.
  (2) It was a large, complex "secondary" group.
  (3) It was part of a still larger organization.
  (4) It had a pyramidal and hierarchical structure with a single head at the top.
(b) The head of the organization was able to induce others to achieve the purposes for which the organization was established. The leader's and the subordinates' jobs were focused on the achievement of a goal, and this goal was not established as a *personal* requirement of the head.
(c) Achieving the goal requires an acknowledged *interdependence* between leader and subordinates. The leader not only had to acknowledge this interdependence, but he had to act in a way which showed his dependence on the subordinate group (reciprocal interaction).
(d) To achieve results, the leader had to *integrate* other needs of subordinates with the requirements of top management. He did this by making technical improvements which smoothed out the work flow and reduced interpersonal conflict.

(e) The leader's authority was exercised by his playing a *dual* role. He was the group's representative to higher management, and he was higher management's representative to the plant. Neither role was subordinate to the other, and for any given administrative problem, his role as representative of the subordinate group *preceded* his role as agent of higher management.

5. Guest listed the following as the kinds of conditions that appear to be present in the effective exercise of authority:

(a) *Leeway to act*—the leader must be allowed to exercise his discretion.
(b) *Time perspective*—a successful leader will focus his activities on a longer time perspective rather than chiefly reacting in response to immediate emergencies.
(c) *Horizontal work-flow interaction*—in a complex hierarchical organization, in order for a leader to induce others to work toward a common goal, he cannot rely on the vertical system alone. For him to gain the cooperation of subordinates, he must also be aware and make use of the horizontal system of communications required by the work flow.
(d) *Enlarging the span of cognition of the leader and subordinates*—for a leader to induce others to act requires that he establish mechanisms for himself and for others that allow both to be continually enlarging their "span of cognition" (how each activity or speciality fits into the whole system of socio-technical relationships).
(e) *Group interaction*—authority cannot be successfully exercised when those in command positions rely solely on the one-to-one superior-subordinate relationship. Many administrative decisions must be generated within and evolve from interactions which take place in primary groups, even though such "groups" are rarely provided for in the formal structure of organization. When these groups function effectively, they become something more than an additional mechanism of efficient communication. They serve a support and reinforcement function for the individual and serve to counteract the feelings of alienation and anomie often characteristic of life in large bureaucratic organizations.

6. The author concluded with a plea that the technologist and behaviorist be brought together and share jointly in planning for an organization.

An appendix reviews past research on (1) the sources of tension and stress which tend to militate against goal achievement in groups and organizations, (2) the process of change, and (3) the role of the primary agent in bringing about change.

113

KNOWLEDGE UTILIZATION: SOCIAL SCIENCE

Knowledge conversion process
Middleman role

ANALYSIS AND SUGGESTIONS

Guetzkow, Harold. Conversion barriers in using the social sciences. *Administrative Science Quarterly,* June 1959, 4, 68-81.

Purpose

The author poses some answers to the question, "What is involved in converting basic social science knowledge into a form suitable for application in practical affairs?"

Method

The ideas in this article are based on the broad experience and observations of the author.

Findings and Conclusions

1. The basic products of social science are tested theories. The process of utilizing these theories is very different from the task of generating them. General knowledge must be converted to a form useful for making predictions in concrete situations.

2. The conversion of general knowledge into a

usable form can be viewed as consisting of a three-fold process: (1) re-identifying and measuring usable variables in concrete settings; (2) selecting variables from alternative theories and composing these variables into a relevant model; and (3) determining the magnitude of important constants in the selected system, so that specific predictions may be made for each different situation.

(a) *Re-identification and measurement of variables*—it is difficult to transfer laboratory methodology to the field situation. In most cases simplification of measuring devices is a prerequisite for successful application.

(b) *Model selection*—there are three basic difficulties likely to be encountered in choosing appropriate theories for problem solution.

(1) Social science is still in its early stages. Its theories are often inadequate for application to a particular situation; therefore alternatives may yield but a half-fit, which makes choice among them difficult.

(2) There is inadequate dissemination of basic knowledge among practitioners and lay users. Often the applier merely asks for "more knowledge" instead of inquiring how a particular independent variable or two will exercise their effects upon a given, well-defined dependent variable.

(3) The user of social science must immediately work with an interrelated system, rather than being able to quasi-isolate specific aspects of a situation. Most research is done in parts and not related to the other parts of the problem.

Social science generalizations must be constructed with feedback systems incorporated as integral parts of the model being used.

(c) *Parametric determination*—specification of initial conditions enables one to telescope the past and to provide data essential in making predictions about the future. It is also necessary to ascertain the weightings of the variables in an ongoing situation to make successful applications of knowledge.

3. *Shared Responsibilities.*

(a) The social scientist is responsible for: (1) The conceptualization of the variables and the indication of routes for their operational measurement, and (2) the specification of the way in which variables are related to one another.

(b) The practitioner must ascertain for different concrete situations the magnitude of the parameters, at the specific time when the application is being made.

4. *Middlemen*—using Schramm's model of utilization,

Scientist — Middleman — Practitioner / Technician — Ultimate User

Guetzkow focuses on the possible functions of a middleman, who could transform basic knowledge from the various social sciences into usable forms. The author calls these middlemen social engineers. Their role would include:

(a) The development of practical alternative measures, once a variable has been conceptualized and operationalized.

(b) The selection of appropriate theory from the alternatives. (This function would require an individual who was broadly trained and given adequate time for continuous updating of his knowledge across the disciplines.)

(c) The repeated analysis of initial conditions and factor weightings each time the concrete situation changes.

5. Failures in the workability of social science knowledge may be traced to inadequate assessment of initial conditions and incorrect estimates of the weightings attached to particular factors in a given situation.

6. Problem situations often demand systems which cross the traditional academic disciplines. There are distinct differences in the intellectual tasks confronting the social scientist and the user of social science knowledge. Experts needed for using knowledge are different from those needed for its discovery.

114

ORGANIZATIONAL CHANGE
Change strategies
Change factors

REVIEW OF LITERATURE

Hage, J. and Aiken, M. *Social change in complex organizations.* New York: Random House, 1970.

Purpose

This book discusses theory and surveys research findings with regard to why some organizations are more successful than others in making the necessary changes that attempt to resolve organizational problems. The discussion is conducted within the framework of sociology and deals with three classical problems in the study of social change: the kinds of change, the causes of change, and the pattern of change.

Method

The authors review the sociological literature on social change in organizations and present a general theoretical framework, consisting of organizational factors related to program change. They also present a number of case discussions to illustrate parts of their theory. This work does not report original research but presents a theoretical basis for subsequent testing of the theory.

Findings and Conclusions

1. *Program Change: the problem of change within the system*—the authors theorize that program change is related to seven dimensions of organizations, four of which are structural and three, functional. The following hypotheses deal with the structural dimensions:

(a) The greater the complexity, the greater the rate of program change. "Complexity" refers to the level of knowledge and expertise in the organization.
(b) The higher the centralization, the lower the rate of program change. "Centralization" is the way in which power is distributed.
(c) The greater the formalization, the lower the rate of program change. "Formalization" refers to the degree of codification of jobs.
(d) The greater the stratification, the lower the rate of program change. "Stratification" of an organization means the differential distribution of rewards to the jobs.

The following hypotheses deal with the functional dimensions related to change:

(a) The higher the volume of production, the lower the rate of program change. "Production" refers to the relative emphasis on the quantity or quality of the organization's products or services.
(b) The greater the emphasis on efficiency, the lower the rate of program change. "Efficiency" means the reduction of the cost of the product or service.
(c) The higher the job satisfaction, the greater the rate of program change. "Job satisfaction" refers to the morale of organization members.

For each hypothesis the authors present a short theoretical discussion and review of research supporting their hypothesis. Two case studies are discussed: one of an organization low in program change; the other, high in program change.

2. *Styles of Organizational Change: the problems of change of the system.* Hage and Aiken describe two ideal types of organizations. The kind of organization which changes little or slowly they call a "static style" organization. Organizations which change faster are "dynamic style" organizations. This distinction corresponds to the distinction between the "mechanical model" and the "organic model," commonly used in the sociology of organizations. The authors attribute the different styles to the relative stability of the environments of the different kinds of organization; thus, a stable environment tends to produce a static organization; an unstable environment tends to produce a dynamic organization. They present five case histories illustrating different organizational styles.

3. *Stages and Strategies: the problem of the change process.* The authors describe four stages of organizational change:

(a) Evaluation: a period of study and assessment of the need for a new program.
(b) Initiation: the management's decision to implement a program.

(c) Implementation: the actual installation of an innovation.
(d) Routinization: the organization's attempt to stabilize the effects of the new program.

In each stage the authors discuss various strategies which may be used to overcome common problems. Finally they review other sociologists' ways of looking at the stages of organizational change.

4. *Limitations, Predictions, and Problems.* In review, the authors discuss their reasons for not dealing with psychological variables and sociological variables other than the seven related to change. They review one study undertaken in a psychological perspective, and three approaches which other sociologists have taken: (a) the study of organizational goals, (b) the study of organizational technology, and (c) the study of human relations in organizations. They conclude with brief discussions of the history and future of organizational sociology, making recommendations for future research.

115

RESEARCH UTILIZATION
Utilization strategies
Utilization deterrents

ANALYSIS & SUGGESTIONS

Halpert, Harold P. Communications as a basic tool in promoting utilization of research findings. *Community Mental Health Journal*, 1966, 2(3), 231-236.

Purpose

The author's purpose in this paper is to identify the barriers to the effective communication of research findings, and to suggest ways of overcoming these barriers so that research will be utilized.

Method

Dr. Harold Halpert is Chief, Systems Research Section, Mental Health Services Development Branch, National Institute of Mental Health. The paper is based on his general experience; no specific experiments, case studies, or surveys are cited.

Findings and Conclusions

1. Merely imparting or transmitting the results of research is usually insufficient to achieve utilization. If an objective for the communication of research results is to get people who plan and conduct service programs to put into practice those principles and methods which incorporate the new knowledge, then the people with whom we wish to communicate need to be specified.

2. When the potential "consumers" of a given piece of research have been identified, one strategy to insure greater utilization is to review and analyze completed research in terms of its applicability to service programs. Another strategy is for a funding agency to analyze consumer needs before research is undertaken, and attempt to interest researchers in filling those needs.

3. The barriers to communication identified by the author and his related recommendations are as follows:

(a) Innovators frequently do not write up their findings, either because they simply do not care to do so or because financing is not available to cover the costs of writing. Publication and write-up charges should be accepted as an integral part of R&D costs.
(b) Potential utilizers face data retrieval problems: they are flooded with information which is neither adequately indexed nor clear in terms of practical implications. And—doers often are not readers.
    (1) Efforts should be made to prepare abstracts and review papers aimed at particular audiences and focused on particular problems such as aging, delinquency, and alcoholism, with guidelines for application of new techniques. In this way, new information is sifted, summarized, and presented in a manner that maximizes its utility and attractiveness.

(2) Interdisciplinary conferences should be held, dealing with specific themes. Adequate and readable reports of such conferences should be prepared and disseminated.

(3) Financing should be made available for visits by operating personnel (potential users) to similar programs that have made innovations. Such visits should emphasize critical evaluation of the innovations as well as provide opportunity to get acquainted with the principal experimenters in the new types of programs.

(4) In-shop consultants should be employed to provide regular advice on innovations and their application, and to serve as intermediaries between researchers and practitioners.

(c) Practitioners frequently perceive the researcher as being so divorced from practice that his research findings are unlikely to have practical value, especially for program implementation.

(1) Communications barriers resulting from overspecialization of roles can be reduced by giving practitioners research training, and by giving researchers experience in research utilization.

(2) High-status practitioners should be made the main targets for the initial communication of innovation, in the hope they will serve as models to their colleagues. In general, it is helpful to develop people who can serve as links between researchers and practitioners.

(d) Practitioners are frequently wedded to old techniques that proved valuable in the past—and are reluctant to change.

(1) New techniques should be presented as contributing more effectively to the achievement of established organizational goals, and as being improvements and refinements of older techniques, rather than as being totally unrelated to the organization's past experience. Research utilization is facilitated if practitioners can become directly involved in trying out new procedures.

(2) Communication regarding a new procedure or innovation should be repeated many times.

116

RESEARCHER-PRACTITIONER COLLABORATION

Linkage measures
Evaluation procedures

ANALYSIS AND SUGGESTIONS

Halpert, H. P. Research utilization: A problem in goal setting—what is the question? Paper presented at the meeting of the American Public Health Association, Atlantic City, November 1972.

Purpose

This paper encourages mental health administrators and researchers to think carefully about the questions they are asking before looking to research for the answers. Much time, money, and effort are expended on research related to mental health programs. But even exciting and relevant findings are often inadequately utilized. The author examines communication gaps between the researcher and the administrator in mental health.

Method

The author is chief of the systems research section at the National Institute of Mental Health. His opinions presumably are based both on readings in the mental health field and on his professional contacts with researchers and administrators.

Findings and Conclusions

Halpert emphasizes one point: that researchers and administrators should get together and think

hard about the questions that need to be answered by research before the former conduct studies and the latter try to use resultant findings. Research workers often focus on answerable questions which are not relevant to the critical issues which confront program administrators. Program people are dazzled by the hardware of research and tend not to specify their real information needs.

Most programs do not—but should—operate according to clearly specified goals and objectives, with built-in criterion measures for evaluation and mechanisms for instituting change when the program begins to go off course. At both intra-agency and inter-agency levels, according to Halpert, insufficient attention is given to achieving broad consensus on clearly stated goals. Only after this is done should either research or action proceed.

117

CHANGE DETERRENTS
Change agent

ANALYSIS

Halpin, Andrew W. Problems in the use of communications media in the dissemination and implementation of educational research. In K. Goldhammer and S. Elam (Eds.), *Dissemination and implementation: Third annual Phi Delta Kappa symposium on educational research.* Bloomington, Ind.: Phi Delta Kappa, 1962, pp. 171-200.

Purpose

The position of this author is that "We suffer less from a dearth of findings than from a lack of sufficient guts to act upon those findings we do possess." There is a schism between knowledge and action. Halpin outlines some of the problems he sees in getting information and change to the educational practitioner.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. The difficulty in promoting change comes from: (a) the fact that the objectives of education are unclear and that their avowed purposes, even to such extent that they are clear, fail to receive unequivocal support from our society; and (b) public education is virtually a monopoly in most American communities.

2. The "need affiliation" of most teachers and school administrators acts as a barrier to change. Need affiliation produces a desire for sameness or equality among the practitioners. They are unwilling to be different for fear it will affect their status within their peer group.

3. Halpin offers some objections to the idea of the educational change agent. He contends that the notion of the change agent is based on the fallacy that research needs to be translated into another language. Perhaps the scientists are at fault for abusive use of jargon. He points out the practical problem of obtaining individuals who can serve competently in this position, particularly since most institutions will not pay a top-level salary or offer a top-level position to an educational change agent.

118

INNOVATION: HIGHER EDUCATION
Cross-cultural change
Change agent

ANALYSIS AND SUGGESTIONS

Harrison, R. and Hopkins, R. The design of cross-cultural training: An alternative to the university model. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York, Holt, Rinehart & Winston, 1969, pp. 373-395.

Purpose

The paper presents a detailed analysis of the inadequacies of American higher education with regard to the preparation of change agents in cross-cultural situations. A more suitable alternate model is described.

Method

The method is one of analysis and speculation based principally upon the experience of Peace Corps workers.

Findings and Conclusions

1. Conventional American higher education is not suited for training to be applied in situations requiring the ability to adapt to or act in unfamiliar and ambiguous social situations, including all types of community development or community action at home or abroad.

2. Differences between conventional university education goals and those of overseas education are presented as they relate to communication, decision making, commitment, ideals and problem solving.

3. Appropriate "meta-goals" (approaches to learning and personal development that the learner acquires in the process of being educated) for cross-cultural training are contrasted with those of the traditional college and university classroom in terms of the sources of information employed, the learning settings, the problem-solving approaches used, the role of emotions and values, and the criteria of successful learning.

4. The design principles for cross-cultural training, in contrast to those of the university classroom, stress the following purposes.

(a) To develop in the student more independence of external sources of decision, information, problem definition, and motivation.
(b) To develop in the student the "emotional muscle" he needs to deal constructively with the strong feelings that are created by conflict and confrontation of values and attitudes.
(c) To enable him to make choices and commitments to action in situations of stress and uncertainty.
(d) To encourage him to use his own and others' feelings, attitudes, and values as information in defining and solving human problems.

These purposes have implications for the place in higher education of problem solving, immediate data orientation, value orientation, experience-action orientation, the use of authority, and the use of expertise. Training settings and staff preparation for this type of education are discussed.

119

KNOWLEDGE DISSEMINATION
Research-practitioner gap
Knowledge linkage institutions

ANALYSIS

Havelock, Ronald G. Dissemination and translation roles. In T. L. Eidell and J. M. Kitchel (Eds.), *Knowledge production and utilization in educational administration.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1968, pp. 64-119.

Purpose

The purpose of this paper is to analyze the roles, institutional arrangements, and problems involved in the process of linking research knowledge to potential users—of bridging the "knowledge gap" between research and practice.

Method

The author has drawn on his own knowledge and on the available literature on research dissemination to prepare this comprehensive overview and guide to effective use of linking roles.

Findings and Conclusions

1. A great variety of roles are linking roles in one way or another. The linker may play several linking roles in sequence, and sometimes he will not perform a linking role at all. Eight major types can be identified: conveyor, consultant, leader, innovator, defender, knowledge-builder, practitioner, and user.

2. All the important functions which are needed to establish and maintain linkage between knowledge sources and resources on the one hand, and users, consumers, and clients on the other, should be seen as forming an interlocking chain.

3. The resource system includes the scholar, the basic researcher, the expert, the producer and packager, and applied R&D. The consultant and conveyor link this system to the client system, which includes the defender, the innovator, the leader, and the user.

(a) The primary institutional form in which the resource system is realized is the university. There are two legitimate ways for academic faculty members to dispense knowledge: through the courses taught in the academic curriculum, and through publications and papers addressed primarily to colleagues.

(b) Linkers have five primary types of institutional base: university, government, commercial, practice, and independent. (An example of the latter is the informal role of opinion leader.)

4. In the client system there are two principal institutional patterns:

(a) *The profession*—a high-status group of independent operators bound together in a reference group with tough membership prerequisites (e.g., law, medicine). Professionals in private practice are not linked to the resource system to any extent. They are dispersed throughout the community, having a great variety of contacts, but they are not primarily oriented to sharing knowledge with colleagues or to building knowledge as such. They are primarily oriented to providing service.

(b) *Bureaucracies*—characterized by division of labor, leadership, and interdependence. These three attributes should, in theory, facilitate linkage. If leadership is effective, and communication lines open and efficient, the specialized nature of bureaucratic roles make them promising targets for the linker.

5. There are major limitations on independent linkers: They cannot serve on a full-time basis; their efforts are likely to be sporadic and their influence haphazard; they cannot be relied upon to provide training, special skills, and equipment and supplies which may be necessary accompaniments to innovation.

6. Linking institutions can be divided into permanent and temporary organizational units.

(a) Permanent units include centers, institutions, laboratories, companies, and associations.

(b) Temporary units include projects, programs, committees, courses, conferences, and conventions.

7. Permanent linking institutions provide three important possibilities for linkers: security, identity, and coordination. Possible disadvantages are isolation, self-satisfaction, and rigidity. It is largely through a suborganization into temporary systems that linking institutions avoid these pitfalls.

8. The linker's activities can be grouped into three kinds of processes: getting information (input), processing information (throughput), and distributing information (output). There is the danger of overload at each stage.

9. *"Marginality" can be a problem*—the linker takes from the research world but he is not clearly a part of that world, and he gives to the practice world while not being clearly a part of that world either.

10. There are four things that have to be done to build a functioning system of knowledge linkers—

(a) build an institution which includes and supports the required roles (installation);
(b) recruit candidates to serve in these roles (recruitment);
(c) train recruits to fill the roles (training); and
(d) supply the equipment necessary to do a good job (equipping).

120

RESEARCH UTILIZATION
Knowledge dissemination
Change agent
Change via temporary systems

ANALYTICAL MODEL

Havelock, Ronald G. New developments in translating theory and research into practice. Paper presented at the 96th annual meeting of the American Public Health Association, Detroit, Mich., November 1968.

Purpose

This article reviews the current use of a total systems approach to knowledge flow, isolates some essential features of this approach, and attempts to point out its peculiar advantages as a process of bringing the gap between research and practice.

Method

The author utilizes the current literature concerning the utilization of research results in this survey of the feasibility of a total systems approach.

Findings and Conclusions

1. The total systems approach promotes effective and meaningful applications of scientific knowledge by creating a social system which will link research to practice in an *interdependent* relationship.

2. Present information systems are primarily supplements to the scientist's own information-gathering processes, having little relevance or value to the practitioner.

3. An important premise is that a social system has to exist before a technical system can be introduced.

4. Two broad categories of social innovation on which some development has been taking place are "temporary systems for collaboration" and "specialized knowledge-linking change-agent roles."

5. Essential features of the temporary systems for collaboration are these:

(a) There needs to be joint goal setting by practitioner and research representatives.
(b) There needs to be serious work done on the diagnostic level.
(c) There needs to be systematic retrieval of resources relevant to the diagnosis.
(d) There needs to be continuous analysis and feedback on the human relations of the collaborative processes as they emerge.
(e) There needs to be self-conscious documentation and evaluation of the meetings, to maintain the structural integrity of the system and to provide feedback to the researchers and practitioners who participated.

6. One of the major tasks of the change agent is to plan and initiate collaborative temporary systems, and to build from these the more permanent connections between researchers and practitioners which are necessary to make a field function as a total system.

7. There is a need for handbooks and reference manuals which are specifically addressed to the change process itself, to aid change agents in the field.

8. There is a great need for systematic experimentation and development to improve the linkage of research and practice.

121

KNOWLEDGE DISSEMINATION

Dissemination factors
Dissemination/utilization models
Knowledge linkage roles
Communication media

ANALYTICAL MODEL

Havelock, Ronald G. *Planning for innovation through dissemination and utilization of knowledge.* Ann Arbor, Mich.: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1969. (Final report, contract No. OEC-3-7-070028-2143, Office of Education, Department of Health, Education, and Welfare.)

Purpose

To assess the current state of knowledge with respect to the process of dissemination and utilization (D & U) and to derive implications for the guidance of researchers, practitioners, and policymakers.

Method

The essential formula that guides the analysis in this study is: *Who* says *what* to *whom* by *what channel* to *what effect* and for *what purpose?* This encompasses the research (resource system), the practitioner (user system), the "message" (data, theory, method, services, and product), the media, and some evaluation of the extent and impact of utilization.

The study was carried out by an extensive literature review (approximately 4,000 items) and the formulation of models for categorization and integration of such literature.

Findings and Conclusions

1. Within the individual, factors relating to D & U can be classified as enduring characteristics (competence, authoritarianism, open/closed-mindedness, values, needs, past experience) and those less enduring and accordingly more subject to change (sense of threat, tendency of individuals to compare selves with others, fear, self-fulfilling prophecies concerning expectations, ability to process information, motivation, and capacity for attitude change). When threat, fear, and potentially conflicting values are aroused—that is, are relevant to the situation—resistance is enhanced. Lack of arousal may lead to a more rational evaluation of the alternative actions presented by the new knowledge.

2. Within the organizational context:

(a) The factors that *inhibit input* of new knowledge are: need for stability, the organization's shared way of ordering things, internal social cohesion, fear of malevolence of outsiders, fear of personal threat to particular insiders, local pride, organizational status, overall economic conditions of the organization, training and socialization process for new members (that is, training which stresses not rocking the boat), size of organization as a whole (generally speaking, larger organizations are more innovative).

(b) The factors which *facilitate input* are: the reward value of the new knowledge itself, a change in organizational leadership, perception of crisis, specialized "input" training,

the importation of new staff members who already have new ideas, the installation of specialized knowledge-seeking and innovating subunits (such as R & D laboratories).

(c) Factors *inhibiting output*: need for stability, inertia, complacency, perceived vulnerability, inadequate or overlimited organization goal definition, perceived lack of readiness of client, professed danger to client.

(d) Factors *facilitating output*: free and open competition, crisis, affluence, internal openness, organizational values which support quality output, and specialized output roles and subsystems.

(e) Factors which *inhibit throughput* (that is, flow of knowledge within organization, both vertically and horizontally): division of labor and subgrouping of membership, specification and separation of specialized task roles, formation of an organizational hierarchy, innovation-suppressive reward patterns and training, traditional bureaucratic patterns of leadership.

(f) Suggested *strategies* for *facilitating throughput* of new knowledge: develop a newer style of leadership which includes a mix of technical, organization, and human relations skills, conduct organization development training programs, develop shared perceptions and superordinate goals with which all subunits can identify, increase genuine participation and influence-sharing up and down the hierarchy, build overlapping subunits with multiple-shared memberships, provide for periodic job rotation, create specialists in the linking process, restructure to optimize the knowledge flow function.

3. The following typology of knowledge-linking roles is formulated:

(a) *Conveyor*: transfers knowledge from producers (scientists, experts, scholars, developers, researchers, and manufacturers) to users (clients and consumers).

(b) *Consultant*: assists users in identification of problems and resources, provides linkage to appropriate resources, assists in adaptation to use, serves as facilitator, objective observer, process analyzer.

(c) *Trainer*: instills in the user an understanding of an entire area of knowledge or practice.

(d) *Leader*: effects linkage through power or influence in one's own group.

(e) *Innovator*: (this includes not only the actual originator but also the first person in a social system to take up new ideas) initiates diffusion in the user system.

(f) *Defender*: sensitizes the user to the pitfalls of innovation, mobilizes public opinion, public sensitivity, and public demand for adequate applications of scientific knowledge. (NOTE—while most linkers are assumed to be facilitators, the defenders supply warranted inhibitions.)

(g) *Knowledge builders as linkers*: (includes basic scientist, scholar, applied researcher, R&D manager, and engineer) serves as gatekeeper for the knowledge storehouse, defines goals of knowledge storehouse, defines goals of knowledge utilization, maintains dual orientation of scientific soundness and usefulness.

(h) *Practitioner as linker*: makes available to clients those practices and services which incorporate the latest scientific knowledge.

(i) *User as linker*: takes initiative on own behalf to seek out scientific knowledge and derive useful learnings therefrom.

(NOTE—this study, at various points, established two classes of users of new knowledge—the practitioner and the consumer—that is, the mental health practitioner and the patient or the educator and the pupil.)

4. The relative utility of categories of media are suggested:

(a) One-way transmission media serve to inform mass audiences and to catalyze further information-seeking within the user system. (For innovation-prone users, one-way media may be sufficient for evaluation, trial, and adoption.)

(b) One-way feedback on the impact of the transmitted information should be a very valuable input to researchers and disseminators but is very seldom elicited by most resource systems.

(c) Two-way transmission is imperative for the adoption of innovation requiring alterations in attitude or behavior because it is conducive to increased involvement on the part of the user and exposes him to the pressures of group commitment.

5. Three D&U models are identified:

(a) *The research, development, and diffusion model (RD&D)*—

(1) assumes that there is a relatively passive target audience of consumers which will

accept the innovation if it is delivered through the right media, in the right way, at the right time.

(2) calls for a rational sequence of activities from research to development to packaging before dissemination takes place.

(3) assumes large-scale planning.

(4) requires a division of labor and a separation of roles and functions.

(5) is subjected to continuing scientific evaluation.

(6) bears a high initial development cost and anticipates a high payoff in terms of quality, quantity, long-term benefit, and capacity to reach mass audience.

(b) *Social interaction model (S-I)*—

(1) is sensitive to the social relations network—to the fact that a complex and intricate set of human substructures and processes must be operative before diffusion will succeed.

(2) has a sophisticated awareness of the variety of positions a user can hold in the network (opinion leader, innovator, laggard, early majority, etc.).

(3) stresses the importance of face-to-face contact.

(4) recognizes that people tend to adopt and maintain attitudes and behaviors which they perceive as normative for their psychological reference group.

(5) assumes that the size of the adopting unit is essentially irrelevant (that is, findings from one setting can be applied to the analysis of another setting, regardless of size and other differentiating characteristics).

(6) adheres to the following phase model of the adoption process: awareness, interest, evaluation, trial, adoption—with appropriate influencing strategies used at each stage.

(c) *Problem-solving model (P-S)*—

(1) the user's needs are the starting point for the research, rather than the destination.

(2) diagnosis is a precursor to the quest for solutions—that is, you not only identify the problem but pinpoint its underlying cause.

(3) the outside helper is essentially nondirective; the user is guided as he does his own problem solving.

(4) utilization of internal resources (homegrown and home-stored knowledge is stressed.)

(5) self-initiated change appears to have the firmest motivation basis and the best prospects for long-term maintenance.

(d) The investigators stress the advisability of unifying and integrating the foregoing three models through proper linkers.

(e) Certain specific functions of government with respect to knowledge utilization are suggested: monitor the total system, facilitate linkage where barriers exist, add components where there are significant gaps, discourage the growth of divisive and maladaptive subsystems.

6. The investigators cite seven factors which account for most D&U phenomena, as follows:

(a) *Linkage*—there must be reciprocal and collaborative relationships between resource system and user system. Within the user system, innovators must be linked to opinion leaders who in turn must be linked to followers. The content of the innovation must be linked to the user—that is, it must be relevant. Media should be compatible to both sender and receiver in terms of experience and style.

(b) *Structure*—resource system must have meaningful division of labor and coordination of effort, must have coherent view of client system, and must plan its D&U activities in structured sequence. User system must be organized to receive input, must have adequate internalized problem-solving strategy, The new knowledge must be coherent in form and substance, and be coherently transmitted.

(c) *Openness*—the resource system must have a willingness to help and a willingness to listen and to be influenced by user needs and aspirations. The user system must actively reach out for new ideas, new products, new ways of doing things; it must be willing to take risks and adapt innovations to its special situation. New knowledge must be open and accessible to inspection and evaluation by user. Diffusion strategies must be flexible.

(d) *Capacity*—for both resource and user systems, capacity is measured in terms of wealth, power, status, education, intelligence, and sophistication, which have been demonstrated to be good predictors of successful innovations and utilization. For the user, it also means self-confidence plus the resources to call upon outside help.

(e) *Reward*—the resource system receives positive reinforcement through profits if it has a commercial orientation; if its orientation is basic research, the rewards come from recognition by colleagues, satisfaction from creating something that works, feedback from satisfied clients. The user system is rewarded if the benefits derived from the innovation warrant the investment of time, money, and effort.

(f) *Proximity*—the chance of an innovation's being accepted and effectively utilized is positively related to its nearness in time, place, and context, its familiarity and its recency. Proximity can be psychological as well as physical. Proximity facilitates linkage.

(g) *Synergy*—several inputs of knowledge, working together over time, produce knowledge utilization. This final factor, then, means programmed and purposeful redundancy: a variety of messages must be generated pertaining to the same piece of information and these messages must be directed at the potential user on a number of different channels in a number of different formats, all coordinated to the one goal of adoption of innovation.

7. Seven phases are enumerated for the change agent in moving a client from the present state of affairs to the desired future state of affairs. They are: building a relationship, diagnosing the problem, retrieving relevant knowledge, selecting the innovation, developing supportive attitudes and behaviors, maintaining impetus for change, stabilizing the innovation.

122

RESEARCH UTILIZATION
Researcher-practitioner gap
Change agent
Change via temporary systems

ANALYSIS

Havelock, Ronald G. Translating theory into practice. *Rehabilitation Record,* November-December 1969, 24-27.

Purpose

To formulate suggestions which will help close the gap between research and practice.

Method

The paper is based on the author's experiences in the field of research utilization.

Findings and Conclusions

1. For the most part, research knowledge is used primarily by researchers, rather than by practitioners.

2. Better techniques of dissemination will not, of themselves, close the gap between researcher and practitioner; what is needed is a total system approach to knowledge flow.

3. Though much headway has been made in the area of storage and retrieval of scientific information, at this point these advances are more useful to the researcher than to the practitioner.

4. The author focuses on two categories of social innovation which he perceives as useful bridges between research and practice: temporary systems and change agents.

5. With respect to temporary systems, he stresses the need for such events to be structured not only so that there is some contact and face-to-face interaction but also so that the issues which divide and the bonds which unite these two worlds can be thoroughly explored.

6. The following features of a successful temporary system are enumerated.

(a) There must be joint goal setting by practitioner and researcher.

(b) The task must be approached diagnostically; start with an identified problem that needs solution rather than a solution in search of a problem.

(c) Retrieval of resources should encompass not only research evidence but also practices, methods, models, and specific individuals who could be used as consultants.
(d) There should be continuous analysis and feedback on the human relations of the collaborative process as they emerge.
(e) There should be documentation and evaluation of what takes place during the meetings of the temporary system, as well as subsequent follow-up to assess effectiveness.

7. The following points are made with respect to the change agent:

(a) We are moving away from the notion of the agent as the conveyor of new facts, innovations, and research (as in the agricultural county agent) toward a concept of the agent as consultant, facilitator, and catalyst.
(b) The change agent is often charged with setting up collaborative temporary systems and with building more permanent connections between researchers and practitioners.
(c) There is still lack of understanding of the role of the change agent. This needs further defining, and appropriate training to equip persons to fulfill the role.
(d) Central to the function of the change agent is his capacity to identify informed persons. He needs to know who the experts are, how to approach them, how to use them effectively. (NOTE—the Michigan-Ohio Regional Educational Library has a storage and retrieval system which contains the names of people who would be useful consultants on a particular topic or in the planning of a particular type of project in the field of education. The author suggests that there be more of these "human resources banks.")
(e) Handbooks and reference manuals with respect to the change process would aid the change agent in capitalizing on the successful experiences of others tackling comparable problems.

123

INNOVATION: EDUCATION
Change factors
Innovation measures
Change agent

ANALYSIS AND SUGGESTIONS

Havelock, Ronald G. *A guide to innovation in education.* Ann Arbor, Mich.: Center for Research on the Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1970.

Purpose

This manual is directed to the change agents of education, identified by the author as "the many educators who are working for reform at all levels, helping school systems, schools, and individual teachers learn about new developments in administration, classroom management, curriculum, and teaching methods." The manual is presented as an easy reference in the planning and day-to-day management of change.

Method

The analytical method is augmented by case material and citations from the literature related to change.

Findings and Conclusions

1. Building a relationship between the change agent and the people to be served involves the following considerations:

(a) Relating to the client system: what are its norms, who are its leaders, who provides informal leadership, who are the gatekeepers, and with what elements within the client system does the change agent feel he can most effectively work?
(b) Relating to the larger social environment: what are its norms, what is the quality of community leadership, who are the influential persons in the community, to what extent should the change agent devote his effort to

these outside forces?

(c) The relative advantages of the inside versus the outside change agent must be weighed.
   (1) The insider has the advantage of knowing the system, speaking the client's language, understanding the norms, identifying with the system's needs and aspirations, and being a familiar figure; he has the potential disadvantages of lacking perspective, lacking special knowledge or skill, not having an adequate power base, having a record of past failure, lacking independence of movement, and facing the need to redefine relationships with other members of the system.
   (2) The outside change agent has the advantages of starting fresh, having perspective, being independent, being in position to introduce something genuinely new; his potential disadvantages are that he is a stranger, he lacks "inside" knowledge, and he may not have the close identification with the problem which the insider has.

(d) The ideal relationship between change agent and client should encompass reciprocity, openness, realistic expectations, a well-defined structure (roles, procedures, etc.), shared power, minimum threat.

(e) The change agent should be alerted to the following danger signals which might threaten the relationship and imperil the likelihood of bringing about change: a long history of unresponsiveness to change; the client's attempt to use the change agent as pawn; the client's preexisting commitment to a position; powerlessness of the client; fundamental incapacity of the client.

2. Once the relationship has been established, the first task of the change agent is to guide the client in making a diagnosis.

(a) If the approach is identification of problems, both surface symptoms and underlying causes must be studied and interpreted.

(b) If the approach is identification of opportunities, emphasis is on client's strengths as well as weaknesses.

(c) A third approach is to arrive at the diagnosis through an understanding of the client system; its interrelationships and interdependencies, how the subgroups work together toward common goals.

(d) The following checklist is offered as an aid in making a systemic diagnostic inventory:
   (1) What are the system's goals?
   (2) Is there an adequate structure for achieving these goals?
   (3) Is there openness in communications?
   (4) Does the system have the capacities necessary to achieve its goals?
   (5) Does the system reward its members for working toward its goals?

(e) Some possible pitfalls in the process of making a diagnosis are suggested: wasting too much time and energy on diagnosis; using the diagnostic phase as a way of stalling; using diagnosis for destructive confrontation; imposing your own favorite diagnosis; fire-fighting (responding to client pressure for crash programs).

3. The change agent must know when, where, and how to acquire resources (printed material, people, products) to share with his client.

(a) Resource acquisition serves a variety of purposes: diagnosis, awareness of what is new and/or available, evaluation before trial, trial, evaluation after trial, installation, maintenance.

(b) The resources for diagnostic information can be tapped through such strategies as: using the problem vocalizer as informant; using key informants within the system; group interviewing; observation; observing and measuring system outputs; organizing a self-diagnostic workshop for the client system; using an outside diagnostic research team; collaborative systematic diagnostic program; continuous quantitative diagnostic monitoring.

(c) Awareness of "resource universe" can be built and maintained through: mass media, personal acquaintance network, familiarity with information systems (libraries, clearinghouses, data banks, etc.).

(d) A strategy for applying resources to the solution of a diagnosed problem includes: acquiring an overview from a comprehensive written source; obtaining an overview from a knowledgeable person; observing the innovation in "live" form; obtaining evaluative data; obtaining the innovation on trial; acquiring a framework for evaluating the results of the trial.

(e) The change agent should so indoctrinate the client that know-how concerning resources acquisition becomes a permanent capacity.

4. Once the client knows what his needs are and is familiar with the resources upon which he can draw, how does he choose the solution which is right for him? The change agent can guide him through a four-step process.

(a) Deriving implications from research by: retrieving summary statements; reformulating and checking for understanding; establishing relevance to client's setting; staging implications for action.
(b) Generating a range of solutions through brainstorming.
(c) Feasibility testing in terms of potential benefit, workability, and diffusibility.
(d) Adaptation to the realities of the client's setting.

5. In gaining acceptance for the innovation, the change agent is alerted to a number of levels of acceptance and strategies for reaching these targets.

(a) As the individual goes through the phases of adoption (awareness, interest, evaluation, trial, adoption, integration) the change agent provides support with a series of matching phases: promoting awareness by providing exposure to the innovation; supporting interest by stimulating search for information; aiding evaluation by providing demonstration of innovation; bolstering trial by providing training; helping the individual adjust to the adoption phase; and nurturing the integration of new skills to assist the integration.
(b) The adoption by the community calls for identification by the change agent of the community's innovators, resisters, and leaders; he diagnoses the forces for and against the innovation and uses the community's key people (pro and con) as stepping stones in gaining group acceptance.
(c) Effective communication is a core activity in gaining acceptance; the change agent utilizes a range of media to reach the right people at the right time.
(d) The program must remain flexible so that acceptance will be lasting; this may call for revisions of the innovation or revision of the implementation strategy.

6. To stabilize the innovation, the change agent must be aware of several long-term as well as immediate goals.

(a) To insure continuance of the innovation, there must be continuing reward, practice to assure mastery of the new skills and procedures involved, structural integration of the innovation into the client's system, continuing evaluation, providing for continuing maintenance of the innovation, and a continuing capacity for adaptation.
(b) The client should learn to be a change agent for himself; that is, he should be aided in creating a capacity for self-renewal.
(c) In an adroit and sensitive manner, the change agent must schedule and carry out his ultimate disengagement from the client after a successful innovation project.

124

CHANGE AGENT
Innovation: education
Organizational change

ANALYSIS AND SUGGESTIONS

Havelock, R. G. *The change agent's guide to innovation in education.* Englewood Cliffs, NJ: Educational Technology Publications, 1973.

Purpose

This guide to the *process* of innovation was written for people working for reform at all levels of the education system. It provides information on how successful innovation takes place and how change agents can organize their work toward this end. A six-stage model of the change process is presented. Three appendices (one an annotated bibliography) provide supplementary resource information.

Method

The author draws on literature, on research, and on his own extensive experience.

Findings and Conclusions

Various change agent roles are discussed, including those of process helper, catalyst, advocate, solution-giver, and resource linker. Four cases are presented, featuring different approaches to change at different levels of the educational system.

The author presents the following six-stage change model:

1. *Relationship*—the successful change agent must first develop a viable relationship with the client system or a solid base within it. A secure and reasonably well-delineated helping role is an essential place from which to start.

2. *Diagnosis*—after establishing an appropriate relationship, the change agent must guide the client in making a diagnosis. This involves identifying the problems, identifying the opportunities, and insures that the agent thoroughly understands the client as a system. Common pitfalls of the diagnostic stage include spending too much time on diagnosis, using destructive confrontation, imposing the change agent's favorite diagnosis, and responding to client pressure for a crash program.

3. *Acquiring relevant resources*—seven major purposes of resource acquisition are given under the acronym D-A-E-T-E-I-M: Diagnosis, Awareness, Evaluation-before-trial, Trial, Evaluation-after-trial, Installation, and Maintenance. The author discusses the change agent's acquisition strategy and the permanent capacity for resource acquisition, which the client will need.

4. *Choosing the solution*—Havelock examines four steps in this stage: (a) deriving implications from research, (b) generating a range of solution ideas, (c) feasibility testing, and (d) adaptation.

5. *Gaining acceptance*—after a solution has been developed and adopted by the change agents, it must be presented to the client system. By describing, discussing, and demonstrating, the change team helps the client to gain awareness, develop interest, evaluate, try out, and finally adopt the innovation. Havelock discusses how individuals and groups accept innovations, and the importance of communicating and keeping the program flexible.

6. *Stabilizing the innovation and generating self-renewal*—as the last stage in the change process, the client needs to develop an internal capability to maintain the innovation and to continue appropriate use. Here the change agents encourage organization members to become change agents themselves in an effort to insure continuance and to create a self-renewal capacity. Ultimately, the change agent must carry out his own disengagement from the innovation project.

125

INNOVATION: EDUCATION
Linkage function
Innovation correlates

EMPIRICAL STUDY

Havelock, R. G. Resource linkage in innovative educational problem solving: Ideal vs. actual. *Journal of Research and Development in Education*, 1973, 6, 76-87.

Purpose

The purpose of the article is: (1) to present the problem-solving dialogue linkage theory affecting innovation developed by the author after extensive review of the literature on communication and change, and (2) to compare this ideal, theoretical formulation with the current status of innovation in school districts as determined by a recent national survey.

Method

The survey called for detailed information on one major innovative effort attempted in each school district during the 1970-71 school year, together with lists of areas in which the districts had been innovating. The questionnaire form also elicited information on resource linkage, resource utilization, and various aspects of school functioning that might be related to innovativeness. An innovative-

ness score was derived from the data, and a number of descriptive variables were correlated with the resultant index.

In conducting the survey a stratified sample of several hundred school districts was employed. Distinctions were drawn between districts with under 80,000 pupils and those with over that number.

Considerations and criteria derived from the theoretical model were applied to the data obtained in the survey.

Findings and Conclusions

1. The problem-solving dialogue model is presented in the circular process whereby the consumer-to-be conveys his needs to the resource or solution-building element, from which information or solutions are diffused back to the consumer or utilizer. This simple paradigm may be elaborated to include additional facets of the process as it occurs in real practice. For the purpose of the present report, considerations of linkage are stressed.

2. In the survey of participants in the school innovations, as might be expected, teachers and other staff (unspecified) predominated in key roles, both in the larger and smaller districts. Also reported in considerable numbers are: the community, pupils, administrators, and parents. In the smaller districts the superintendent, assistant superintendent, and supervisors/specialists are also notably involved. Various formal outside agencies, including universities, received relatively limited mention.

3. A number of variables were found to have a low but statistically significant correlation with the school district innovativeness index. Notable among these were: the number of pupils, per pupil expenditure, utilization of media specialists and centers, in-service training, utilization of lay advisory groups, frequency of teacher strikes, student unrest, and several others.

4. The authors of the survey consider an outstanding finding of their research to be the sheer extent and intensity of innovative activity in U.S. public education as reported by the responding superintendents. Relatively speaking, "capacity" is seen as a persuasive factor upon innovation, but other linkages entailing community and resource specialists are also regarded as important. Within the school, teacher participation is noted as a key factor. Less evident are influences by universities and other formal outside agencies, although there is little indication of negative attitudes toward these sources. This preliminary report of one type of monitoring effort is not viewed as having yielded completely satisfactory answers to the question of how better linkage can be achieved.

126

RESEARCH UTILIZATION
Change process: education
Change models

ANALYTICAL MODEL

Havelock, R. G. *Ideal systems for research utilization: Four alternatives.* Washington, D.C.: Social Rehabilitation Service, U.S. Department of Health, Education, and Welfare, 1974.

Purpose

The 480-page report is the outcome of a request by the Division of Research Utilization of the Social and Rehabilitation Service (SRS), Research Utilization Branch of the U.S. Department of Health, Education, and Welfare, to design a research utilization (RU) system. The Center for Research on Utilization of Scientific Knowledge (CRUSK), Institute for Social Research, University of Michigan, responded with a proposal to prepare four alternative designs, three by leading national researchers and scholars in the field (Edward M. Glaser, Ronald Lippitt, and Everett M. Rogers) and the fourth by the principal investigator (Ronald G. Havelock), the last designed to synthesize the best ideas of the other three and to represent wherever possible a "consensus view."

Method

The project entailed a series of steps:

1. The three chief consultants met with the

principal investigator and staff to determine types of input required, a definition of research utilization system, a delineation of users, design specifications, input and report delivery schedules, and budget.

2. CRUSK staff provided the consultants with the following input materials: reports of the write-up of 33 in-depth interviews with SRS staff relative to research utilization and of site visits to five Federally supported information service agencies.

3. Three research utilization designs were prepared by the consultants and their self-selected teams.

4. An "integration" conference was held to derive common themes and principles, and to select the most promising ideas of the three designs.

Findings and Conclusions

1. General considerations.

(a) The synthesis design refers to a system that is comprised of eight component functions, as follows:
   (1) Need sensing, activating, and communicating.
   (2) Knowledge production.
   (3) Knowledge storage and scanning.
   (4) Knowledge processing.
   (5) Dissemination.
   (6) Utilization.
   (7) Evaluation of the system and its impacts.
   (8) Integration of the system and its components (1-7)

(b) It is suggested that a research utilization system should service the R&D information needs of policymakers, administrators at all levels, practitioners, clients, and the general public in areas related to the Social and Rehabilitation Service, thereby reducing the gulf between the research and the potential user.

(c) The "procedures to insure value" fall into three broad categories: transforming the R&D product, transmitting knowledge, and helping users in employing knowledge.

(d) The interactional relationship between the knowledge resource and the user may be charted with varying degrees of complexity.

(e) It is assumed that to be effective and good, a RU system should be rapid, relevant, rigorous, replete, responsive, replicable, revisable, redundant, and rewarding.

(f) There is not necessarily a single RU system. Rather, a number of alternate operational modes, varying in their emphasis on different system components, may be specified, as follows:
   (1) Coordinated mission-oriented R&D program.
   (2) R&D product dissemination service.
   (3) Continuous flow dissemination.
   (4) Natural network nurture.
   (5) Knowledge-based, problem-solving consultation service.
   (6) Instant response R&D retrieval service.
   (7) Rapid response R&D report service.
   (8) User-centered R&D report service.

The report devotes a chapter to the essentials of the paradigm used to describe the elements of the research utilization process and the eight alternative operational modes. Basically, the research and user communities are viewed as separate problem-solving systems requiring two-way communication between them as a prelude to the event called "research utilization." The two systems and the communication linkage processes are analyzed in detail. Each of the eight modes is charted to show interrelationships among numerous specific elements.

2. Alternate design for research utilization system for SRS: Glaser et al.

(a) The Glaser team presentation of a design system is organized around five major considerations and is summed up in a chart serving the functions of needs sensing, knowledge acquisition, knowledge dissemination, implementation, evaluation, and system integration. The main topics discussed are as follows:
   (1) Mission and target constituencies to be served.
   (2) Major program areas.
   (3) Proposed organization staffing and functions.
   (4) Specific strategies.
   (5) Initiation, generalizing, and scaling of costs of the system.
   (6) Underlying rationale of the system.

(b) The central *mission* of the Division of Research Utilization (DRU) is to "serve as a vital spark and substantive resource to facilitate improvements in service delivery for SRS-related service programs." Federal, regional, state, and local units need to work together toward this end.

(c) Further, to achieve this mission, seven major

areas of *program activity* are needed:

(1) Information from all levels needs to be incorporated into research funding priorities and strategy plans, and unresolved problems need to be publicized.
(2) DRU should translate identified needs to encourage inputs from knowledge and research.
(3) DRU should maintain existing media for dissemination of research information, and translate findings into alternatives to current practice.
(4) DRU should stimulate, coordinate, and sometimes initiate efforts to get relevant but underutilized existing R&D findings or promising new knowledge put into action.
(5) DRU should evaluate the efficacy of the outcomes of its efforts.
(6) The several elements should be integrated with SRS and with other developmental, rehabilitation, and service delivery systems such as manpower, mental health, education, criminal justice, etc.

(d) A proposed organization chart is presented for achieving the mission and program activities. The *organization* is designed to mesh with the growing trend toward decentralizing program activities to the regional, state, and local levels. The functions of the several coordinating, knowledge acquisition, dissemination-implementation, and evaluation units are set forth. A Research Utilization Advisory Committee is recommended.
(e) Detailed *strategies* are proposed that entail conferences, grant and contract inputs, field projects, dissemination media, information systems, liaison with universities, telecommunication hotline, and evaluation procedures.
(f) Suggestions are made as to steps in initiating the RU system, the possibilities for *generalizing* it beyond the Social Rehabilitation Service, and the *articulation* of the system with funding realities.
(g) The *rationale* for the proposed design includes a number of guiding concepts.
(1) A central concern of any RU system is how to locate or obtain good R&D that helps meet really important problems.
(2) An effective RU program goes beyond technical problems of achieving better diffusion of information or knowledge to include the consideration of social and political factors, and needs to be viewed as an important, integral part of a broad strategy for improving the quality of life.
(3) The knowledge base for the proposed RU system should include current and past SRS activities and projects plus seemingly relevant knowledge discovered from related fields such as mental health, manpower, and public health.
(4) Interaction between researchers and potential users should be increased at various stages of the process.
(5) Utilization should be a central concern of every SRS division, program, and project, and not just of DRU.
(h) Three checklists are included as practical aids in the consideration of grant or contract applications or of research utilization programs.

3. A knowledge utilization system for SRS: Lippitt et al.

(a) The Lippitt team presents their proposal in terms of: desired outcomes of an effective knowledge system, causes of nonachievement of desired outcomes, assumptions as to what is required to achieve desired outcomes, images of what the structure and process would look like, what would be required to achieve the implied changes, and some of the "traps" of doing "minor revisions" of the current system.
(b) Some of the *desired outcomes* include:
(1) The generation and the articulation of the need for knowledge.
(2) The development and mobilization of knowledge from inside and outside the system.
(3) The processing and testing of knowledge.
(4) Storage and access to knowledge.
(5) Dissemination of knowledge.
(6) Supporting the utilization of knowledge.

(c) Clues about causes of nonactualization of the most effective patterns of knowledge utilization are presented in reference to the six elements presented above.
(d) Some 19 *assumptions* about the conditions required to achieve desired outcomes are presented. These assumptions deal with priorities, relationships, perceptions, time and distance considerations, interpersonal communication, knowledge interchange, problem-solving processes, documentation and

evaluation, variations in the knowledge utilization process, resistance, cognition-behavior relationship, involvement of users, organizational considerations, the place of nonspecialists, time and energy resources, personnel training, and R&D tie-in with dissemination.

(e) What the *structure and process of the system* looks like can be inferred from the preceding analysis. The concrete parts of the system include elements such as the following: staff meetings, orientation events, exchange of knowledge meetings, phone call retrieval, training, local inquiry processes, resource directory, retrieval conference, retrieval of innovative practices, action research teams, knowledge testing, training workshops, practice exchange, field testing, futurist propositions, knowledge storage and access, available places and space, staff involvement, training in linkage, external resources, multimedia packages, findings exchange, experimental tryouts, volunteer dissemination teams, collective dissemination, knowledge utilization, risk competition, recognition ideas, support structures, and newsletters.

(f) To *achieve the desired changes* two sets of ideas are offered, one dealing with strategies for change, the other with implementation mechanisms.

(1) Suggested *strategies* include:
- Strategy planning for change.
- Team building of vertical and horizontal task groups.
- Formation of *ad hoc* groups to do trial feasibility testing.
- Action research groups.
- Involvement of university personnel, knowledge retrieval centers, and other experts.

(2) Implementation mechanisms include:
- Conference of technical resource people.
- The technical resources panel on a regional basis.
- Advisory committee.
- Telephone contact.
- Regional inter-agency exchange-of-practice-and-planning meeting.
- Annual visiting committees.
- Annual regional conference.
- National products report.

(g) Some ten dangers of "doing better what one is doing now" are listed.

(h) A series of related papers are appended to the Lippitt presentation.

4. Design for a research utilization system for the Social and Rehabilitation Service: Rogers et al.

(a) The Rogers team defines a research utilization system as a set of arrangements and procedures by which research-validated or research-derived knowledge is transformed and transmitted to a community of users. Its report centers about a set of 21 recommendations for the design of the SRS research utilization system. These recommendations were devised following a detailed analysis of SRS in the light of criteria stemming from the general nature of a research utilization system that is seen as including the following elements:
(1) Needs assessment.
(2) Translation of needs into research questions.
(3) Conduct of utilization research.
(4) Memory of innovations.
(5) Implementation of innovations.
(6) Evaluation and research.

(b) Recommendations related to *needs assessment* include the following:
(1) That a national user panel should be established.
(2) That an in-service training program should be designed.
(3) That needs assessment advisory councils be established.
(4) That social indicators be gathered, using both obtrusive and unobtrusive measures to indicate client needs.
(5) That participant observation should be used for defining needs.

(c) Recommendations related to the *translation of needs into research questions* including the holding of research needs conferences, publication of lists of research problems and funded projects, the institution of a small grant program for dissertations and for SRS researcher retraining.

(d) Recommendations related to the *conduct of utilizable research:*

(1) That every SRS-funded research project should receive a field site visit while it is underway, by a review committee composed of potential users.
(2) That every SRS research proposal include plans for utilization of the eventual results, including use of newer media,

and necessary budget provision for disseminating the results.

(e) Recommendations related to *memory of innovations*:
  (1) That the contents of the SRS memory system should be classified as to user problems, rather than on the basis of research topics.
  (2) That the SRS memory system should have the capacity to respond to telephoned requests as well as written ones.
  (3) That users' "standing needs" may be submitted to the SRS memory system so that an individual will continue to receive every relevant item with respect to a specified need.

(f) Recommendations related to *implementing research results*, including stress on user need in information packaging, expansion of change agent teams, use of electronic print media, and the utilization of certain local SRS offices demonstrating selected innovations.

(g) Recommendations related to *evaluation and research* include a proposal for an Evaluation Division in the SRS Office of Research Utilization to conduct research and evaluation studies on research utilization, including research on prototype procedures by which SRS research could be utilized.

5. The report provides a series of SRS utilization case problems to serve as a kind of testing ground for considering the concrete operation of a design of a utilization system. Each of the three consultants indicates how, in his opinion, his design might bear on each of the problems.

6. The results of the integrative conference for SRS research utilization system design, during which the three consultants met with the project team, are presented under a set of headings similar to those referred to under section 1(a) of Findings and Conclusions.

7. Information-packed reports of site visits to the following agencies are reported:

(a) Congressional Research Service
(b) Defense Documentation Center, Department of Defense
(c) MEDLARS, National Library of Medicine
(d) NASA Office of Technology Utilization
(e) National Technical Information Service, Department of Commerce

8. With Educational Resource Information Center (ERIC) added to the list as given above, the agencies were charted in terms of salient points under the following eleven functions, namely: acquisition, screening, cataloguing, storage, transforming information, user access, dissemination, user assistance, communication from users and analysis of needs, and feedback to knowledge producers and sources.

Overall conclusions as to factors related to these functions are presented. An appendix reproduces the schedule of questions employed in the site inteviews.

9. One of the appendices is devoted to a report by the principal investigator entitled "What do we know from research about the process of research utilization?"

127

INNOVATION: EDUCATION
Change models
Change measures

ANALYTICAL MODEL

Havelock, R. G. Models of the innovative process in U.S. school districts. Paper presented at the meeting of the American Educational Research Association, Chicago, April 1974.

Purpose

The purpose of this phase of a larger study of innovations in school districts was to relate the preferences of school superintendents for procedural emphases in the innovative process to three "ideologies" previously gleaned from an extensive review of the literature on planned change and knowledge utilization. These theories are characterized as: (1) problem solving; (2) research de-

velopment and dissemination (RD&D); and (3) social interaction.

Method

As part of the fuller survey of school innovations, district superintendents responded to a list of 21 statements related to innovative procedures. A majority of the statements were intentionally devised to represent the three ideologies referred to above; the remaining items related to other procedural matters.

Ratings of preferred emphasis on a five-point scale were obtained from 296 school district superintendents. By correlating the ratings of each item with those of every other item it was possible to derive a factor analysis designed to yield an "objective" grouping of the statements. A further analysis yielded findings for districts with pupil populations over 80,000 as contrasted with those under 80,000. In addition, an overall district innovativeness score was determined and correlated with the ratings of each of the 21 statements.

Findings and Conclusions

1. The main features of the three models of planned change and knowledge utilization are presented as follows:

(a) The *"problem-solving" model* rests on the primary assumption that innovation is a part of a problem-solving process within the user, reflecting a sense of need, problem diagnosis, search for and retrieval of ideas and information useful in formulating and selecting the innovation, and the trying out and evaluation of the effectiveness of the innovation. Stress is placed on user initiative.

(b) The *RD&D model* assumes a rational sequence in the evolution and application of an innovation which provides for planned research, development, and packaging before mass distribution takes place, with division and coordination of labor in respect to the several process elements involved. It assumes a passive, but rational consumer.

(c) The *social interaction model* stresses the diffusion process with its network of social relations in which individuals have status positions, with informal personal contact and group membership as prominent features, and with a predictable S-curve pattern for innovations as far as adoption is concerned.

2. The factor analysis resulted in the following grouping of statements relative to innovative procedures as preferred by the superintendents:

(a) Factor I: *Problem-solver perspective:*
  (1) Maximizing chances of participation by many groups.
  (2) Finding shared values as a basis for working.
  (3) Providing a climate conducive to sharing ideas.
  (4) Stressing self-help by the users of the innovation.

(b) Factor II: *RD&D perspective*:
  (1) Systematic evaluation.
  (2) Solid research base.
  (3) Systematic planning.
  (4) Adequate definition of objectives.
  (5) Adequate diagnosis of the real educational need.

(c) Factor III: *Strategic manipulation*:
  (1) Participation by key community leaders.
  (2) Taking advantage of crisis situations.
  (3) Involvement of informal leaders of opinion inside the schools.

(d) Factor IV: *Open advocacy and humane dialectic*:
  (1) Confrontation of differences.
  (2) Resolution of interpersonal conflicts.
  (3) Creating awareness of the need for change.
  (4) Creating an awareness of alternative solutions.
  (5) Providing a climate conducive to risk taking.

(e) Factor V: *Financial capacity*:
  (1) Starting out with adequate financial resources to do the job.

(f) Complex items:
  (1) Selecting a competent staff to implement change.
  (2) Utilizing a number of different media to get new ideas across.
  (3) Persistence by those who advocate the innovation.

3. The first two factors as designated by the investigator line up fairly well with the first two ideologies as depicted, namely the problem-solving and the RD&D perspectives. The social interaction model is less distinctly covered by the third factor. A fourth factor, combining both linkage and conflict models, comes through, and may represent "the emergent radical-liberal approach to change of the late 1960s." A fifth factor refers to financial capacity. Three of the 21 statements are found to be complex residual items not specifically falling under any of the factors.

4. While no one of the sets of ratings of the 21 innovative elements yielded much of a correlation with the total district innovativeness score, there was some variation in the size of the correlations obtained. The judged responses regarding emphasis on the RD&D elements showed the lowest relationship to the overall innovativeness measure.

5. All of the 21 change strategy items were rated quite high by the superintendents. The authors conclude that "the competing ideologies of change should each be seen as elucidating equally important but distinct aspects of a total reality."

128

CHANGE AGENT
Change process: strategies
Individual reeducation

ANALYSIS AND SUGGESTIONS

Havelock, R. G. and Havelock, M. C. *Training for change agents.* Ann Arbor, Mich.: Institute for Social Research, University of Michigan, 1973.

Purpose

This guidebook provides prospective trainers and program developers with some suggestions for training change agents, with an emphasis on educational change. The first part of the book details how to go about designing a training program for change agents. The second part examines alternative training models, suited to particular change problems and settings.

Method

The authors and their colleagues at the Center for Research on the Utilization of Scientific Knowledge at the University of Michigan convened a conference of fifty nationally recognized leaders in the fields of training and educational change. This book is more than a compendium of the papers presented at this conference; it presents a catalogue of various approaches to change.

Findings and Conclusions

Chapter 1. *Our Contemporary Knowledge of the Change Process.* This chapter explores concepts of change—a problem-solving process, a research-development-diffusion process, a process of social interaction, a linkage process, etc.

Chapter II. *Goals of Training.* Four dimensions of training goals are presented: breadth, relation of goals to trainee characteristics, psychological wholeness, and transferability.

Chapter III. *Some Principles of Good Training Design.* In this chapter, topics relevant to good training designs are discussed: structure, relevance, specificity, generality, reinforcement, in-process evaluation and feedback, openness and flexibility, linkage, involvement, cost effectiveness, redundancy, synergy, transferability, compatibility, and wholeness of learning.

Chapter IV. *A Framework for Training Designs.* This chapter describes eight design features for training programs: definition and rationale for the role; criteria for trainee selection; outcomes expected of trainees; ways to provide training to achieve outcomes; ways to set the role in an institutional context (installation); criteria for program success; evaluation process for a training program; and utilization of evaluation findings.

Chapter V. *Self-Renewal within the School System.* The second half of the guidebook suggests how training programs can be put together to meet various types of objectives. Subtopics covered in this chapter are: training the school-community resource team; training for the knowledge utilization function role; minimal training system for self-renewal in school systems; and an integrated model of counselor behavior.

Chapter VI. *Linking Schools to Outside Resources.* The authors present the recommendations of a task force which designed a program for creating a knowledge utilization specialist team.

Chapter VII. *Effecting Political and Structural Change in Schools.* Here, the authors discuss change roles involving political linkage, and change through crisis.

Chapter VIII. *Changing the Larger System.* This chapter provides two perspectives on change in organizations: a macrosystems approach and a proposed conference approach to solving the "delivery dilemma" of state departments of education.

Chapter IX. *Sample Model of a Fully Developed Training Design.* This chapter presents a more detailed training model for the role of change agent in a state education agency. The authors discuss the following aspects of the training design: roles; qualifications for candidates for the training program; anticipated outcomes of training; the training procedure; guidelines for installation of trainees in state agency positions; suggested criteria for evaluation; alternative procedures for evaluation; and feedback and utilization of evaluative data.

The guidebook concludes with an appendix entitled "What Change Agents Should Know About Professional Associations."

129

RESEARCH UTILIZATION
Change models
Linkage functions
Change agency

CASE STUDY-ANALYSIS

Havelock, R. G. and Lingwood, D. A. *R&D utilization strategies and functions: An analytical comparison of four systems.* Ann Arbor, Michigan: Institute for Social Research, University of Michigan, 1973.

Purpose

The purpose of the study, with its 389-page report, was to relate federal agency knowledge-diffusion strategy as practiced by four government research utilization agencies to a systematic body of research and theory embodied in a conceptual frame sponsored by the principal investigators. In the course of the application of the research dissemination and utilization model to the work of the agencies, and the reporting thereon, additional purposes were served, as follows:

1. To explain in great detail the "problem-solving dialogue" model sponsored by the investigators as a viable basis for examining any system having to do with research and development, dissemination, and utilization.
2. To set forth "maximal criteria in terms of which the functions of a dissemination-utilization agency may be judged."
3. To present a monitoring device for surveying the linkage activities engaged in by a dissemination-utilization agency, and to obtain responses of agency personnel to a proposed questionnaire designed for this purpose.
4. To collate suggestions via a conference of dissemination-utilization agency staff concerning such topics as need sensing and alternative solution delivery.
5. To obtain ratings by dissemination and utilization agency personnel on a 20-item checklist representing various dimensions of pertinent ideology and strategy, and to present a ten-point, acronymic rating schema for analyzing important process issues in a dissemination and utilization system.

Method

1. Largely by means of interviews with staff, profiles of the structure and functioning of the following four research dissemination and utilization agencies were depicted:

(a) Division of R&D Utilization, Manpower Administration, U.S. Department of Labor.
(b) Research Utilization Branch, Social and Rehabilitation Service, U.S. Department of Health, Education, and Welfare.
(c) Mental Health Services Development Branch, National Institute of Mental Health, U.S. Department of Health, Education, and Welfare.
(d) National Center for Educational Communication, Office of Education, U.S. Department of Health, Education, and Welfare.

2. Questionnaire forms were submitted to informed personnel to obtain information concerning actual communication patterns between various agencies, along with data to be used in rating the strategies employed by dissemination and utilization agencies.

3. Well-planned and documented conferences were held in order to collate suggestions from appropriate staff regarding the several aspects of the dissemination and utilization process.

4. Based on a prior survey of the literature and considerable speculative analysis, both a comprehensive model of the research dissemination and utilization process and specific criterial checklists were developed.

Findings and Conclusions

The report is too voluminous to permit a detailed statement of findings and conclusions. However, a selection of the major outcomes can be presented.

1. An overview of the findings is offered as follows:

(a) During the 1960s, support of dissemination and utilization (D&U) emerged as a function of government distinct from R&D.
(b) It is possible to analyze all functions and activities of D&U agencies in terms of a configurational model of resourcer-user problem-solving dialogue.
(c) The manner in which each of the four agencies studied manages the problem-solving dialogue is distinct but comparable with the others.
(d) It is possible to generate communication network maps which include types of information, media, and flow among key subgroups of a larger system.
(e) Research information is rarely used or sought in crisis situations.
(f) Groups in the network study often mention a need for more evaluative and research information.
(g) Attitudes toward D&U are dominated by four ideologies best characterized by the phrases: (1) "communicate and collaborate" (linkage); "help the user where he is at" (user-centering); "plan and organize systematically: (RD&D); and "invest heavily" (capacity).
(h) Linkage is the most important procedural element in the D&U system and the most cited target for system improvement.
(i) Adequate diagnosis of the real user need is the second most important element in the D&U system.
(j) Carefully organizing the D&U system to achieve linkage and user relevance is the third most important procedural element and target for improvement.

2. A "total" system of societal problem solving via research, development, and R&D utilization refers to at least eight types or modes of service, each with a separate special function but all sharing a general set of goals regarding knowledge-based change, as follows:

(a) A coordinated mission-oriented R&D program.
(b) The R&D product dissemination service.
(c) The knowledge-based, problem-solving consultation service.
(d) The *instant* response R&D retrieval service.
(e) The rapid response R&D report service.
(f) Continuous flow dissemination.
(g) User-centered R&D.
(h) Natural network nurture.

The report explains each of these modes and presents an informative diagrammatic expression of the problem elements entailed in each mode, noting relative stress placed on the several stages from the indication of need on the part of users to the delivery of proposed knowledge-laden solutions.

3. Suggestions are made for considering ways of improving a dissemination and utilization system. These include:

(a) Proposals for practical measuring or monitoring of D&U activities.
(b) Methods of choosing priorities beyond that of self-description and measurement.
(c) Ways of improving linkage with policy makers and line agencies.

4. The four research dissemination and utilization agencies are analyzed in terms of the following carefully devised set of "maximal" functional considerations:

(a) User self-servicing, including:
  (1) Developing user's internal problem-solving capability.
  (2) Developing user need awareness and self-sensing.
  (3) Developing user need expression-articulation.
  (4) Developing user interest, skill, and capacity for seeking out useful information and openness to new R&D findings and ideas.

(5) Developing in user a capacity for adaptation and integration of solutions.

(b) Need processing, including:
  (1) Need arousal.
  (2) Need sensing.
  (3) Need definition and redefinition.
  (4) Quantitative needs assessment.
  (5) Transmitting user needs to policy makers.
  (6) Transmitting user needs to the R&D community.
  (7) Transformation of need priorities into program for sponsoring R&D.
  (8) Transformation of needs into problem statements and researchable questions.

(c) Solution building, including:
  (1) Influence of D&U system on R&D to be more relevant to user needs.
  (2) Influence on R&D output to be more disseminable and usable by key target groups.
  (3) Conduct of R&D on D&U process.

(d) Solution processing, including:
  (1) Knowledge transformations.
  (2) Knowledge transmissions.
  (3) User helping.

(e) Microsystem building, including:
  (1) User interchange with R&D personnel.
  (2) User collaborative R&D.
  (3) Integrated RDD&U program.

(f) Macrosystem building, including:
  (1) Macrosystem modeling.
  (2) Macrosystem monitoring.
  (3) D&U system as promotor of linkage.
  (4) D&U system as filling recognized gaps.
  (5) System awareness building.

For each of these headings, under four parallel columns, each of the agencies studied is characterized.

5. With the aid of a questionnaire, respondents drawn from the federal agencies surveyed indicated linkages to and from persons or groups with respect to: who was involved, frequency of contact, medium employed, type of information transmitted, and the use to which the information was put. Additional features of the questionnaire inquiry yielded data as to:

(a) Unmet information needs.
(b) Opinions as to effective ways to assure dissemination and utilization.
(c) Checklist judgments as to the essentiality and actuality of dissemination-utilization processes and procedures. These judgments were factor analyzed, yielding four factors under which the D&U strategy items may be grouped.

6. Ideas gleaned from the literature and experience in the present survey yielded an acronymic, ten-part rating schema entitled H-E-L-P S-C-O-R-E-S for studying or diagnosing D&U problems. The included concepts are these:

(a) Homophily: Similarity of characteristics of sender and receiver.
(b) Empathy: Understanding and feeling for the other and the other's situation.
(c) Linkage: Contact or relationship between persons or groups.
(d) Proximity: Placement of persons or groups near each other.
(e) Structuring: Evidence of planning, ordering, systematic arrangement.
(f) Capacity: Sign of affluence, talent, experience, wisdom, etc.
(g) Openness: Sign of willingness to listen, receive, give, tell, etc.
(h) Reward: Provision of financial support, security, esteem, status, etc.
(i) Energy: Investment of time and effort, persistence, aggressiveness, etc.
(j) Synergy: Coming together of forces, orchestration, synchronization, etc.

Illustrations of each of these factors are combed from the available data.

7. Feedback interface conferences with two groups of D&U agency personnel resulted in additional validated data regarding the agencies studied, and served as a medium for initiating problem-solving activity relative to difficulties noted in the surveys. Conferees were provided with lists of items derived from the basic problem-solving D&U model reflecting the modes and functions previously described. A detailed conference evaluation form was applied as well.

8. An attempt to "bring it all together" in terms of potential practical modifications in D&U agency functioning is presented under the following headings:

(a) Support of user self-servicing:
  (1) Training in problem-solving procedures for practitioners.
  (2) Organizational development consultation and intervention.
  (3) Development or adaptation of systematic tools and handbooks for user self help.

(b) Need sensing and need communication:

(1) Measuring and assessing user information needs.
(2) Responding to stated needs as a vehicle to greater need.
(3) Utilizing long-range need definition and forecasting mechanism.

(c) Bringing pressure to bear on the R&D community:
(1) Require need relevance in R&D proposals.
(2) Require specification of D&U program in R&D proposals.
(3) Ask researchers to write and prepare output for nonresearch audiences.
(4) Transform researchers into disseminators.
(5) Vitalize and routinize a "buddy" system between R&D and D&U project officers.
(6) Support research on D&U.

(d) Transformations:
(1) A comprehensive resource information center and library service.
(2) High-quality state of the art summaries.
(3) High-quality policy briefs.
(4) Development of transformation checklists including such items as: translation, differentiation, integration, collection, simplification, amplification, recomposition, summarization, labelling, embellishing, targeting and tailoring, redundancy cutting, redundancy building, consensual validation, screening, print-print referencing, print-person referencing, and indexing.
(5) Decision and product archiving.

(e) Transmissions:
(1) Maximize R&D input to existing organs.
(2) Develop a daily newsletter for policy makers and administrators.
(3) Provide fast turn-around service for policy makers.
(4) Farm out the dissemination-to-research and dissemination-to-practice functions.

(f) User-Helping:
(1) Employ D&U specialists.
(2) Adapt or redevelop RU manuals.
(3) Modify practitioners' attitudes toward research utilization.
(4) Train practitioners in RU.
(5) Provide RU services in crisis situations.

(g) Microsystem building:
Evaluate effectiveness of past and present microsystem projects.

(h) Macrosystem building:
(1) Monitoring.
(2) Creating a centralized R&D storage-retrieval system.
(3) Building an extension service.

While the above suggested areas for improving D&U systems were prepared with special reference to the Manpower Administration, it is deemed plausible that they are likely to apply to other systems as well.

9. The report concludes with appendices containing some of the instruments used in the surveys and also a practical "Problem-Solving Package for Dissemination and Utilization of Knowledge" prepared by one of the project directors, David A. Lingwood, and intended as a training device.

130

RESEARCH UTILIZATION: R&D LABORATORY MANAGEMENT

Utilization seminars
Evaluation procedures

EXPERIMENTAL STUDY

Havelock, R. G., and Mann, F. C. *Research and development laboratory management knowledge utilization study.* Ann Arbor, Mich.: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1968. (Final report on contract No. AF49(638)1732.)

Purpose

The objective of this project was to develop and study more effective processes for utilizing social science research knowledge in the management of research and demonstration laboratories. Findings obtained from previous work have been met with

polite indifference, misgivings about their relevance, and sharply expressed doubt about their usefulness in the everyday management of laboratories.

Method

1. *Sample:* The "subjects" used in this project were the directors of research and development laboratories. The directors were all from laboratories with staffs of more than 30 professionals in the Detroit-Ann Arbor area of Michigan. The 50 laboratories that met this criterion were contacted with a brochure and letter, followed by a brief telephone interview, and where feasible by a site visit for an extended interview. Thirty laboratories were visited and interviewed. Of the 18 laboratory directors expressing a positive attitude toward the idea, eight attended the regularly scheduled meetings that were the essence of the project design.

The authors cite three primary reasons for participation: (a) some directors saw an opportunity to *share* and *compare*; (b) some directors welcomed the opportunity to *advise* and *criticize* the social science findings; they viewed the project rather as an academic exercise; (c) some directors exhibited a strong urge to *learn.*

2. *Treatment:* For the eight participating directors, 12 bi-weekly, 4-hour sessions were held. Four different types of knowledge inputs were used: empirical social science research findings regarding laboratory management, human relations skills and concepts, learning from colleagues, and survey data from the manager's own laboratories.

A staff of five conducted the "seminar." There was a senior director who chaired each meeting and served as a special adviser to individual laboratory directors when consultation seemed called for, a junior director who coordinated the staff's efforts and directed the research evaluation activities, a group process specialist, an organizational survey specialist, and a graduate assistant who served as a knowledge retrieval specialist and summarizer.

3. *Methods and Measures of Evaluation:* Attempts were made to record, measure, and evaluate not only what was going on at each meeting, but also what was happening between meetings and after the conclusion of the seminar. Information for evaluation was obtained from three sources:

(a) *Self-report measures:*

Each director completed a postmeeting reaction questionnaire following each session. They rated and commented on the meeting as a whole and each clearly distinguishable segment of it.

Checklists on problems and applications, and on use of specific Pelz-Andrews implications,* were used repeatedly to ascertain areas where research findings were used.

Each director participated in a 2-hour interview in which he focused on what he had actually done with seminar learnings.

(b) *Observations of seminar behavior:*

All sessions were taped and later analyzed in detail and coded according to a continuum of movement toward utilization. The continuum covered three basic areas: (1) awareness and understanding; (2) acceptance; and (3) adoption utilization.

(c) *Survey of laboratory staffs:*

Six of the laboratory staffs were surveyed. The information gathered from these surveys was primarily for the use of the directors in the seminar. However, the questionnaire did include a series of questions asking the respondents to indicate whether or not they had observed each of the management practices dealt with in the seminar in operation at any time in the past 6 months.

This information was later juxtaposed with the reports of the director.

Findings and Conclusions

1. From the self-reports of the directors, the authors found a general overall satisfaction with the seminars, with most of the participants expressing a desire to continue this type of activity. Utilization of inputs was definitely apparent. In the postseminar interviews, all the lab directors were able to describe changes in attitude and practice that indicated utilization of knowledge inputs.

2. From the analysis of the tapes made during the seminar meetings, the authors found that over time the comments of the participants moved from those indicating awareness and understanding to comments indicating behavioral acceptance. The tapes indicated that utilization does not take place easily or immediately. The continuing nature of the seminar was considered instrumental in moving participants from cognition to utilization.

3. The laboratory surveys indicated that specific utilizations reported by the directors were generally confirmed by their staffs. Supervisory professionals in most labs reported a noticeable change in the working environment.

*This was the knowledge input for the seminar. Pelz-Andrews (1966), Scientists in Organizations, Wiley (their citation method).

The majority of changes introduced by laboratory directors derived directly from behavioral science data followed by extended discussion and explorations of meanings and implications for action.

4. The follow-up measures indicated that the participating directors were concerned with the diffusion of learnings to their staffs. Several of the directors set up regular seminars with their staffs, modeled in one or more respects after the project seminar.

5. The authors felt the findings indicated that a multiple-input, open-ended approach such as the one utilized in this study could lead to a high level of utilization. Social science findings do have relevance and meaningful action implications, but a linking function is necessary to insure actual use.

131

RESEARCH-PRACTITIONER RELATIONSHIP

Research utilization: highway safety
Change models

EMPIRICAL STUDY

Havelock, R.G. and Markowitz, E.A. *Highway safety research communication: Is there a system?* Ann Arbor, Michigan: Institute for Social Research, University of Michigan, 1973.

Purpose

Based on a theoretical model which contrasted informed versus uninformed decision making, the study undertook to determine the extent to which research and decision making regarding highway safety have progressed since the arousal of concern in the subject was stimulated by Ralph Nader in 1966. The study also purports to offer recommendations for the enhancement of the quality and quantity of effort in regard to highway safety.

Method

The research development, dissemination, and utilization model centers on the R&D community, on the one hand, and the decision-making personnel on the other. For that reason the authors undertook to study the two groups and the linkage between them by means of comprehensive questionnaires following a determination as to who were the R&D professionals and who were the decision makers in the field of highway safety.

The questionnaires sought information concerning the R&D network, recognized opinion leaders, sociometric choices, safety research audiences, media employed, satisfactions with the research environment, and barriers to communication with policy makers. With respect to the decision makers, the study ascertained their background characteristics, their styles and roles in decision making, and their utilization of research.

Data were gathered relative to the comparative perspectives of decision makers and R&D professionals. The attitudes of researchers, research opinion leaders, and decision makers toward a series of "myths" which seemed to prevail in the safety field were also studied. The changing pattern of power and influence was examined in terms of the perception of influence, influence strategies of researchers, and the role and influence of the private sector consisting of safety organizations, the auto industry, Ralph Nader, and the universities and their research centers.

Findings and Conclusions

1. From the vast amount of data assembled the authors draw the following conclusions:

(a) The many individuals and organizations who concern themselves with highway safety collectively constitute a problem-solving system.

(b) Within this collectivity there is a definable subsystem which may be entitled "the highway safety R&D community."

(c) Within the safety community there is a small but very important subgroup, the "research opinion leaders," who form a bridge between the R&D professionals and the decision makers.

(d) There is a definable leadership group in highway safety which deserves to be designated the "key decision makers."
(e) There is a division of opinion within the R&D community regarding practically every issue affecting safety-relevant matters.
(f) In spite of this diversity, it is possible to identify an "old guard" attitude syndrome which blames the driver for the problem, and to identify a "new guard" syndrome which puts more stress on a variety of countermeasures including vehicle design changes.
(g) Real power influence on decisions is divided between the old guard and the new, led by the auto industry on the one hand, and the federal government on the other.
(h) The total system contains all the elements, or subgroups, which are necessary to undertake rational, informed problem solving, but these elements are not present in equal measure for different specialities, such as roads.
(i) The system as a whole is highly connected but not coordinated.
(j) The system as a whole is in a dynamic state conducive to constructive action and progress on a broad spectrum of safety matters.

2. Recommendations are presented as follows:

(a) Optimize highway safety as a problem-solving system.
(b) Increase the total R&D effort:
  (1) Experiment with subsidies for research and development by the auto industry itself.
  (2) Underwrite more road safety research.
  (3) Go all out on development of countermeasures for the alcohol problem.
  (4) Encourage more social research on how the problem-solving system works.
(c) Improve the linkage between and among decision makers and researchers:
  (1) Utilize opinion leaders.
  (2) Organize a research utilization task force at the national level.
  (3) Require research contractors to confer with representative decision makers and to spell out practical implications for decision making.
  (4) Establish and support a national safety research information clearinghouse.
  (5) Support annual conferences with published proceedings on critical topics.
  (6) Consider the suggestions of the researchers and decision makers themselves on improving linkage between them.
  (7) Encourage improved communication within the research community.
  (8) Encourage improved communication among decision makers.

132

KNOWLEDGE UTILIZATION
Change models
Linkage functions

ANALYTICAL MODEL

Hearn, N. E. ESEA Title III: A national model of knowledge utilization and dissemination. Paper presented at the meeting of the American Educational Research Association, New York, New York, February 1971.

Purpose

1. To discuss the use of the Guba-Clark model for research, demonstration, dissemination, and adoption (RDDA) in facilitating educational change. Hearn defends the use of models in general and supports the Guba-Clark model's emphasis on diffusion of new practices in education.

2. To examine the Social Interaction model, which describes what is needed at state and local levels to effect change. The author gives a critique of the "public information" approach to change, an approach which expects people to implement changes once they are given adequate information.

3. To emphasize the Problem-Solving perspective. The Guba-Clark and Social Interaction

models are useful, but more attention should be given to where and how to begin planning for change at the local level.

4. To point out problems remaining as the nation tries to give educators easy access to research and practice.

Method

The author is the Coordinator for Educational Communication, Bureau of Elementary and Secondary Education, U.S. Office of Education. He has also published a study of innovative educational programs. His critiques and recommendations are based on his research and upon his position as a link between researchers, USOE, and educational practitioners.

Findings and Conclusions

1. Although skeptical of models, the practitioner-dominated Bureau of Elementary and Secondary Education adopted the Guba-Clark model to describe planning, evaluating, and disseminating stages of change under the new Elementary and Secondary Education Act, Titles I, II, III, IV, and V. Having searched the Title III literature, Hearn agrees with Guba's contention that Title III is "squarely in the diffusion business." As the Title IV products and model programs became available, administrators could implement them on an experimental basis through Title III. But even demonstrations under Title III are not sufficient to insure widespread implementation.

2. The prevailing philosophy of the Social Interaction model seems to be that good ideas triumph; that rational men will make rational decisions based on simple confrontations with facts. Hearn cites his own findings that projects probably would not be implemented in (a) central cities where social systems are complex, (b) large regional areas where social systems are diffuse, (c) remote rural areas where traditions oppose change. Hearn found that educational changes are more likely to be adopted when (a) local school boards get involved, (b) superintendents openly endorse new projects, and (c) students participate in the changes. This concept of social interaction is valid, but it is not concrete enough to help planners of change.

3. The Problem-Solving perspective assumes that individuals change if they know how to change and for what purpose. Here, people identify their own problems and work together to systematically solve them. Hearn says that the combination of human relations and rational problem solving may make others' strategies for change unneeded.

4. Hearn raises five key questions to focus future thought on facilitating educational change through diffusion:

(a) Can these rational models contend with those who regard problem solving and human relations approaches as nonproductive and irrelevant?
(b) Can the many training programs be synthesized into one or more practical training programs for educational change agents?
(c) Can the roles of universities and colleges be articulated and coordinated so as to develop mutually supporting systems?
(d) Can the efforts of various units in USOE and related educational agencies be coordinated to provide a national focus?
(e) Can the state educational agencies fulfill a knowledge utilization role by taking the leadership in evaluating, validating, and disseminating promising programs?

133

INFORMATION NEEDS
Dissemination of information
Communication media

REVIEW OF LITERATURE

Herner, S., and Herner, M. Information needs and uses in science and technology. In C. A. Cuadra and A. W. Luke (Eds.), *Annual review of information science and technology* (Vol. 2). Chicago: Encyclopedia Britannica, Inc., 1967.

Purpose

To review and summarize studies investigating information needs and uses in the areas of science and technology.

Method

The authors reviewed six methodological approaches to data collection in information research: (1) diaries and user-administered records; (2) interviews; (3) direct observation; (4) questionnaires; (5) indirect methods (studies involving an analysis of records of information use); and (6) combined techniques (studies involving combinations of the above data collection techniques).

Findings and Conclusions

1. Diaries and user-administered records: Two major studies were reviewed in which respondents either telephoned in or kept records of instances of information use. The authors conclude that, due to the gross methodological problems with this form of data collection, the findings from these studies are unreliable and more controlled techniques should be employed.

2. Interviews: six studies in this category were reviewed regarding information flow.

(a) Scientists and engineers generally follow the shortest path, e.g., querying colleagues.
(b) The major information source for smaller manufacturing firms was suppliers of raw material.
(c) Faculty members reported that they considered the personal indexes method too time-consuming.
(d) Biomedical researchers reported that awareness of library source material often resulted from chance, and from references and other publications.
(e) Social scientists experienced in gathering information used fewer information tools and techniques than less experienced users.
(f) A study of information flow in South African industry revealed that the larger the firm the more likely it is to derive benefits from formal information sources (e.g., information centers, technical literature, etc.).

3. Observation: the one observation study reviewed resulted in no reportable findings (due to the methodological limitations of the techniques employed).

4. Questionnaires: eight such studies were reviewed, resulting in the following findings:

(a) A study querying a sample of authors of manuscripts, and the requesters of these manuscripts revealed that requesters were primarily young researchers not having access to "in-group" informal information sources.
(b) A study of the information-using habits of physicists and chemists in the United Kingdom showed that pure scientists (i.e., physicists) are more dependent upon literature than are industrial scientists and technologists (which chemists tend to be).
(c) A study investigating which scientific periodicals were most frequently used by teaching staff members revealed that clinicians use libraries less often than theorists, and tend to use information of a more limited scope than do theorists.
(d) A study dealing with information sources and their effect on technical laboratory workers showed that small internal meetings did not serve as information sources, that a negative correlation existed between exposure to outside consultants/lectures and level of performance, and that attendance at professional society meetings stimulated performance.
(e) A study concerned with attitudes toward eight different information-seeking methods

revealed a high significant correlation between preference rankings for sources, and rankings of ease of use for these sources; and no correlation between preference for source and expected information from that source.

(f) A study investigating the publications requested by physicists and chemists from a United Kingdom library showed that physicists demonstrated the greatest dependence on abstracting sources, while chemists tended to rely on publications listing source titles only.

5. Indirect Studies:

(a) From a study undertaken to investigate the nature of the reference and bibliographic transactions performed by libraries, the authors concluded that the results confirmed previous hypotheses, namely, that they are not used to full advantage.

(b) From a study attempting to define and measure the reasons for which biochemists cite and consult journal sources, the reviewers noted that the most frequently used information dealt with laboratory procedures, methods for preparation of compounds, and methods of identification and quantification.

(c) A study designed to characterize qualitatively and quantitatively the types of reference questions addressed to library staff revealed that the most frequent inquiries were related to whether or not the library has a given title, reaffirming the conclusion that researchers discover and identify useful publications outside the library.

6. Combined Techniques:

(a) One combined technique study investigated and confirmed the hypothesis that information flow within and without the laboratory is mediated by "gatekeepers" (i.e., those persons to whom others most frequently turn for technical advice and consultation).

(b) A study investigating the impact that various information-gathering practices have on the quality of research showed that the use of internal information methods (informal conversations, internal reports, etc.) predominated among more highly rated research teams, while external informal methods (journals, formal meetings, etc.) predominated among the less highly rated teams.

(c) A study undertaken to determine the need for information centers revealed that the use of information centers among the scientists sampled is rare, and there is marked reluctance by pure scientists to delegate their information-seeking problems, presumably because of the highly creative and specialized nature of their work.

(d) A study attempting to measure the information uses of X-ray technologists showed that researchers tend not to use the services for which they express a desire (i.e., information centers); researchers often do not even directly examine the information services which are offered; and researchers perceive themselves as not having the time to put such services to use.

134

COMMUNICATION RESEARCH
Change in attitudes
Communication process components

ANALYTICAL MODEL

Hovland, C. I., Janis, I. L., and Kelley, H. H. *Communication and persuasion.* New Haven, Conn.: Yale University Press, 1953.

Purpose

To study the ways in which words and symbols influence people, to identify and understand major communication variables, and to provide an initial framework for subsequent theory building.

Method

A program of systematic research on variables determining the effects of persuasive communication was begun by the writers several years ago, designated the Yale communication research pro-

gram. The present volume is a report of that research, summarizing experiments which have been completed, and discussing the theoretical formulations developed. It is in a sense a progress report on the preliminary phases of a long-term research program to investigate the principles involved in persuasive communication.

Three central characteristics of the communication research program are: (1) it is primarily concerned with theoretical issues and basic research; (2) it draws upon theoretical developments from diverse sources, both within psychology and related fields (sociology, political science, anthropology) including "learning theory" and "group membership" concepts; (3) it emphasizes testing propositions by controlled experiment.

The authors provide several working definitions as a general contextual framework within which the research is conducted:

Opinion—interpretations, expectations, and evaluations such as belief about intentions of others, anticipations concerning future events, and appraisals of the rewarding or punishing consequences of alternate courses of action. In these studies, opinions are viewed as verbal "answers" that an individual gives in response to stimulus situations in which some general "questions" are raised.

Attitude—those implicit responses which are oriented toward approaching or avoiding a given object, person, group, or symbol.

Communication—the process by which an individual (the communicator) transmits stimuli (usually verbal) to modify the behavior of other individuals (the audience).

The above definition specifies the research task as consisting of the analysis of four factors: (1) the *communicator* who transmits the communication; (2) the *stimuli* transmitted by the communicator; (3) the *audience* responding to the communication; (4) the *responses* made by the audience to the communication.

Findings and Conclusions

1. *The Communicator*—several studies analyzed the effects upon opinion of varying the expertness and trustworthiness of the communicator. The results indicated:

(a) Communications attributed to low-credibility sources tended to be considered more biased and unfair in presentation than identical ones attributed to high-credibility sources.

(b) High-credibility sources had a substantially greater immediate effect on the audience's opinions than low-credibility sources.

(c) The effects on opinion were not the result of differences in the amount of attention or comprehension, since information tests reveal equally good learning of what was said regardless of the credibility of the communicator; variations in the source credibility seem to influence primarily the audiences' motivation to accept the conclusions advocated.

(d) The positive effect of the high-credibility sources and the negative effect of the low-credibility sources tended to disappear after a period of several weeks.

2. *The Communication*—the major portion of the studies reported focus on content stimuli which arouse emotional states or which are capable of providing strong incentives for acceptance of the new opinion and/or rejection of the original opinions held by the audience. Findings reveal:

(a) The major classes of appeals or arguments which function as incentives are identified as:

(1) substantiating arguments which may lead audience to judge the conclusion offered as "true" or "correct";

(2) "positive" appeals which call attention to the rewards to be gained from acceptance;

(3) "negative" appeals, including fear-arousing contents, which depict the unpleasant consequences of failure to accept the conclusion offered.

(b) *Fear appeals*—findings suggest that the use of fear appeals will interfere with the overall effectiveness of a persuasive communication if such appeals evoke a high degree of emotional tension without adequately providing for reassurance.

(c) *Salience of group norm*—communications which call attention to group membership may prompt the individual to take account of group norms in forming his opinion on a given issue.

(d) *Conclusion drawing*—in communications which deal with complicated issues it is generally more effective to state the conclusion explicitly than to rely upon the audience to draw its own conclusion.

(e) *Preparation for future experiences*—findings are consistent with the hypothesis that once a belief is modified by an effective communication there will be a tendency for the newly

acquired opinion to interfere with the subsequent acquisition of any incompatible opinion.

3. *The Audience*—it is generally recognized that people will react differently to the same social pressure; incentives can function adequately only insofar as the individual has the necessary motivational predispositions. These central factors are:

(a) *Group conformity motives*—persons most highly motivated to maintain their membership in a group tend to be most susceptible to influence by other members within the group, and will be most resistant to communications contrary to the standards of that group.

(b) *Individual differences in persuasibility*—

(1) Persons with high intelligence will tend to be more influential than those with low intellectual ability when exposed to persuasive communications which rely primarily on impressive logical arguments.

(2) Persons with high intelligence will tend to be less influenced than those with low intelligence when exposed to persuasive communications which rely primarily on unsupported generalities or false, illogical, irrelevant argumentation.

(3) Persons with low self-esteem are predisposed to be highly influenced by persuasive communication.

4. *Response Factors*—all the studies reported have been concerned with the effects of communications, but in several investigations the special aspects of active participation and duration of changes have been analyzed:

(a) *Active participation*—

(1) When exposure to the same persuasive communication is held constant, individuals who are required to verbalize the communication aloud to others will tend to be more influenced than those who are passively exposed.

(2) Under certain conditions role playing and other means of producing verbal conformity may interfere with acceptance.

(3) Systematic exploration is needed to discover the conditions under which active participation has negative or boomerang effects.

(b) *Duration of effects*—

(1) A study reveals that if the audience is reminded of the source of a communication, there is relatively little change over time in retention.

(2) But normally there seems to be a tendency to dissociate the content from the source and consequently the positive (or negative) influence of the source declines with time.

5. *Emerging Areas of Research Which Require Study Before Further Progress Can Be Made:*

(a) *Internalization processes* (the transformation of outer conformity into inner conformity)—while extensive work has been done on the processes of internalization in clinical studies, there is great need for further systematic analysis of the implications of internalization processes as they occur in communication situations and face-to-face communication.

(1) *Conflict and opinion change*—in order to understand the outcomes of many attempts at opinion change, various kinds of conflict situations must be thoroughly explored (a single communication may arouse two competing sets of motives within the individual; initial reaction to source and to the content may be incompatible; communicator may be highly respected but his proposals may be quite objectionable).

(2) *Perceptions, judgments, and concept formation*—problems of "frame of reference" and "reference groups" point to the necessity of more extensive study of judgmental phenomena.

(b) *Problems in theoretical analysis of persuasion*—there is necessity of isolating the critical factors involved in communication effects. Little research has been systematically directed toward disentangling attention, comprehension, and acceptance; thus an important problem for future investigation is the analysis of those factors which differentially affect attention, comprehension, and acceptance in complex communications situations.

135

INNOVATION: EDUCATION
Innovation measures

ANALYSIS AND SUGGESTIONS

Howard, Eugene. How to be serious about innovating. *Nation's Schools,* April 1967, 79, 89-90, and 130.

Purpose

The author outlines six operating principles for introducing innovations in educational systems.

Method

The author draws on his own experiences and his observations of innovation introduction in other school systems.

Findings and Conclusions

1. Put the philosophy of the organization to work. Write it down. It is effective when: (a) stated in terms specific enough to guide the operational decisions the staff and administration must make, (b) used consistently by the designated leaders in the organization as a guide to administrative decision making, (c) decisions are evaluated on the extent to which they are consistent with the stated philosophy.

2. Build the program from the bottom up. Periodic studies should be made. These can disclose the discrepancies between the stated philosophy and current practices. Provide support for those who view their jobs creatively and are receptive to new ways. Programs build on the commitments. Involvement in the development of innovative practices will lead to a greater probability of success.

3. Encourage an experimental attitude. Supplant inefficient, capricious trial-and-error methods with systematic evaluation efforts. The organizational climate must support mistake making. Innovators need help in asking questions about what they are doing in such a way that the questions get answered. They also need help in finding appropriate information, in interpreting this information in the light of predicted outcomes of the new practices, and in basing future actions on interpretations of the information that has been generated.

4. Pace the rate of change carefully. Watch for overextension, as well as too laggardly a pace.

5. Make organizational structure support its program. Organize structures such as schedules, statements of procedures, budgets, etc., to support innovative activities undertaken by individuals.

6. Don't confuse flexibility with sloppiness. A flexible organization is an organization in which individuals are free enough to make important decisions affecting the quality of their work and mature enough to assume the responsibility for these decisions.

136

INNOVATION: EDUCATION
Organizational factors
Barriers to change

CASE STUDY-ANALYSIS

Institute for Development of Educational Activities. Choosing a model for change. *I/D/E/A Annual Report.* Melbourne, FL: The Institute, 1970.

Purpose

The purpose of the report is to provide a rationale for the establishment of a Quality Schools Network in Illinois. The author describes the failure of past programs, particularly those based on a research and demonstration model, to bring about effective educational innovation. He then presents some

characteristics of more successful programs, all of which operated directly within school systems.

Method

Case study analysis.

Findings and Conclusions

1. Reasons given for the failure of the research and demonstration model:

(a) The school and the school district are social systems in which the introduction of isolated new programs, curriculum packages, changes in time and scheduling, retrained individuals, etc., are vitiated without comprehensive changes in other aspects of the total system. (Example: A closed circuit television system has been installed at great expense in a new high school. It is almost never used since the teachers have never been trained in the educational potential or mechanisms of it. The unused equipment has been vandalized by the students.)

(b) The atypical nature of the staff, resources, and size of student body in the model school has made its new ideas inapplicable to the typical school district. (Example: Extra resources for staff, materials, equipment and facilities have often been given to the model school which would not be available to the traditional schools.)

(c) The problem of working for reform within a school system seems at least as formidable as the problem of developing an alternative educational program, and the two problems are closely interwoven. The research and demonstration approach does not directly deal with this issue. (Example: A high school is designated "a school without walls" by the school board. However, a line administrator above the school indicates that all "field trips" from the school must be approved in advance. In practice, this permission is never granted.)

2. General characteristics of successful programs which have worked from within:

(a) They have been part of a local school district (operating as a separate school or within a school or schools), but have had sufficient autonomy to pursue a comprehensive alternative to prevailing educational practices. (Example: In St. Paul, Minnesota, a small group of administrators seeking change offered to start a school for those students from each high school and junior high who were causing the most trouble. The success of this school has led to the development of a K-12 "open school" serving 500 students and a series of learning centers with special educational emphases.)

(b) The local school system has had a long-term financial stake in the success of the program and identified itself with the program's outcome. Those programs based on temporary outside funding have tended to become abandoned when the outside support is withdrawn.

(c) The program has devoted considerable energy to influencing educational practice in the school system on a wider basis and has experienced success in this area through working directly with other teachers and administrators in the school system over a long period.

(d) The program has developed a local constituency of parents, students, teachers, administrators, and community members who are committed to it.

(e) The program has been composed of a network of people, operating in several different contexts, who can provide each other with mutual advice and support.

3. Recommended principles for action:

(a) A Quality Schools Network should be established as an integral part of a statewide effort to improve Illinois education.

(b) An affiliate of the Quality Schools Network should be a part of a local school district.

137

RESEARCH UTILIZATION
Dissemination of information
Communication process

ANALYTICAL MODEL

Jain, N. C., and Amend, E. A conceptual framework for studying communication patterns in research dissemination and utilization. Paper prepared for the 17th annual NSSC Conference, Cleveland, Ohio, April 1969.

Purpose

In this paper, the authors develop a conceptual model which can be utilized for analyzing, both theoretically and empirically, the communication processes and patterns that are involved in the dissemination and utilization of research results.

Method

The authors begin their paper by demonstrating the need for a framework for analysis, noting the lack of studies dealing directly with the problems of research utilization. After defining their objectives and assumptions, the authors focus on the functions and the nature of the information-handling process in each of the three types of social systems involved in the research dissemination and utilization process: (a) the *research system,* producing and developing research findings; (b) the *linkage system,* disseminating and facilitating the utilization of research findings by (c) the *client system.* Finally, they present their model, and outline some possible uses of the analytic framework.

Findings and Conclusions

1. The functions of the three social systems involved in the process of research dissemination and utilization are: (a) research and development, which includes activities dealing with the production of research information that could be utilized for solving practical problems; (b) dissemination of the activities that facilitate the flow of research-based information to, and its utilization by, the clients; (c) utilization is the application of research-based information to problem-solving behavior.

2. In order to perform these functions, the research system, the linking system, and the client system all handle information. There are three main processes involved in information handling: (a) information inputting, (b) information processing, and (c) information outputting. These are conceptually distinct but interrelated processes. Communication patterns vary with each of the three aspects of information handling.

3. The nature of the involved social systems and the aspects of the information handling processes are used to label the two dimensions of a 3 by 3 matrix having nine cells. The matrix of categories of communication patterns in research utilization can be pictured as follows:

Nature of Social System	Nature of information handling behavior		
	Information input	Information processing	Information output
Research system ____1	2		3
Linking system _____4	5		6
Client system _____7	8		9

4. The possible uses of the framework suggested by the authors include: (a) the generation of meaningful research questions; (b) a tool for examining the interdependence of the communication behaviors of all three systems; (c) a guide for a literature search; (d) a systematic way to identify major gaps and research needs in the area of the communication processes related to research utilization; and (e) a guide to the formulation of generalizations and hypotheses for empirical research.

138

CHANGE PROCESS: EDUCATION
Change dynamics

ANALYSIS

Jenkins, David H. Force field analysis applied to a school situation. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 238-244.

Purpose

The author outlines the basic steps in social engineering and applies them to a specific situation using force field analysis.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

The basic steps of social engineering outlined are: (1) analyze the present situation; (2) determine the changes which are required; (3) make the change indicated by the analysis of the situation; and (4) stabilize the new situation so that it will be maintained.

1. *Analyzing the Present Situation*—before effective plans for change can be made, the present state of affairs must be defined as accurately as possible. What are the forces that are keeping our methods in their present groove? What are the forces driving for change? What are the forces restraining change?

2. *Planning for Change*—changes will occur only as the forces are modified. The task is either to strengthen the driving forces or decrease the restraining forces.

   (a) *Ways forces can be changed*—component forces can be modified in the following ways: (1) reducing or removing forces; (2) strengthening or adding forces; and (3) changing the direction of the forces.

   (b) *Selection of the forces to be modified*—the first step may be to determine what forces, if any, must be dealt with before a change can occur. Are there some forces whose direction can be reversed? Which opposing forces can be reduced with the least effort? Which augmenting or upward forces can be increased?

3. *Modifying the Forces*—based on the foregoing analysis the indicated modification procedures should be initiated.

4. *Stabilizing the New Condition*—whenever change is planned one must make sure that the new condition will be stable. Continued support for the new change is important, otherwise the resistant forces may push back toward the former condition.

139

ORGANIZATIONAL CHANGE
Research methodology
Problem solving

EMPIRICAL STUDY

Jenks, R. S. An action-research approach to organizational change. *Journal of Applied Behavioral Science*, 1970, 2, 131-150.

Purpose

This paper deals with the development, testing, and application of a research instrument designed for use in organizational settings as part of organization change and development efforts. The article describes: (1) the development of a Q-sort instrument, which gathers and organizes data concerning perceptions of behavior and feelings regarding a particular problem facing a workgroup. This instrument is intended to help bring about change in interpersonal relationships. (2) The application of the instrument in an organizational field setting. The author used this instrument in consultation with a group in an industrial setting; he evaluates its usefulness.

Method

The author presents the theoretical and methodological background for the Q-sort instrument. He discusses the difficulties in developing valid field research tools and relates the Q-sort to both the individual and organizational theories from which it derives.

The application section is presented primarily as a case study. It shows how the instrument was used with five subjects and what data it brought to light in this particular instance.

Findings and Conclusions

1. *Development of the Q-sort instrument.* According to the author, the clients of organizational consultants are less adept at defining and solving human problems than they are at defining and solving other problems, such as in finance, production, market development, etc. Currently available action-research methods usually require the consultant to act as a researcher (or therapist) and the client to act as a subject (or patient). Use of a Q-sort methodology allows consultant and client to examine organizational data together.

The Q-sort technique involves people sorting cards, upon each of which is written a statement—in this case a statement about some aspect of an organizational problem. The respondent separates statements which apply to his situation from those which do not apply. Because the statements are drawn from a set of statements known to include various points of view, the researcher can draw conclusions from the responses more readily than if he had simply asked a specific question and received an answer. The author derived his questions from sources in group behavior and from William Schutz's instrument, FIRO-B. The Q-sort instrument assertedly meets requirements of scientific rigor and also meets the following criteria for use in the field:

(a) it deals with specific data;
(b) it deals with a particular present issue;
(c) it provides data which the client needs and asks for; and,
(d) it is easy to administer, analyze, and feed back.

2. *Application of the instrument.* The personnel department of a large midwestern manufacturing corporation was being reorganized in 1966. The author acted as consultant to the planning group for this department, which consisted of the personnel director and four function heads. The department faced the problem of recruiting new people in Personnel, but it was not clear where the responsibility for this function lay. Jenks discusses the reasons why this problem and the organizational Q-sort technique were well suited to each other.

Each member of the group sorted the deck of statement cards once to find statements which expressed his own view of the problem and once to find statements which expressed his perception of the personnel director's view. When the group itself compared (a) the function heads' perception of how the director saw the problem, and (b) the director's perception of the problem, they realized that the director on the one hand and the function heads on the other hand were waiting for each other to produce a solution to the problem. But neither, in fact,

had a solution. This realization enabled them to begin working on the problem in earnest.

The author points out that this use of the instrument is only one of a number of possible uses. He discusses another use, the "ideal sort," where group members use the instrument to set group goals. Finally, the author discusses the strengths and weaknesses of the Q-sort technique and compares it with other instruments for generating, analyzing, and using data in small groups.

140

KNOWLEDGE DIFFUSION: EDUCATION

Innovation reeducation

CASE STUDY

Johansen, L. N. *Report of Title III program.* Schulte Elementary School, Sturtevant, Wis.

Purpose

This project is aimed at the reeducation of teachers for new roles and tasks involved in new organizational patterns.

Method

Includes the operation of a summer laboratory which in the last three summers involved some 340 teachers on an intensive, full-time, 8-week basis. There is also an ongoing diffusion and propagation process during the school year.

Findings and Conclusions

The most pertinent findings to date concern the time involved in seeing payoff from such a program.

"Our experiences to date would indicate that any program of diffusion and propagation must involve a rather long period of time in order to see the spinoff results. We attempted to make some evaluations of our project at the end of 6 months and 1 year and in each case the depth of involvement had not penetrated to the point of producing results one would like to find. However, after 2 and 3 years, we have found many, many examples of the propagation process which works through initial motivation and further interest and visitation, and finally to efforts of implementation either in the school or school systems. In nearly every case, we found that when people are first exposed to innovations they assimilate the ideas and demand further discussion and consideration on their own local levels. If the original catalyst is strong enough they will move to the second phase, which is to visit and learn more about specific things which were identified as innovations. And then they will finally go into their local settings and start turning the wheels necessary to initiate change."

141

RESEARCH SURVEY: MENTAL HEALTH

Research characteristics
Research strategies

COMMISSION REPORT

Joint Commission on Mental Illness and Health. Research resources in mental health. In *Action for mental health.* New York: Basic Books, 1961, pp. 193-224.

Purpose

This chapter is a component of the comprehensive report of the Joint Commission whose overall purpose was to develop recommendations for a national mental health program.

Method

The chapter is based primarily on a monograph by Dr. William F. Soskin, prepared specifically for the Joint Commission. His findings are augmented by suggestions made by the members of the commission staff and by the committee on the studies.

Findings and Conclusions

1. Two important and pervasive aspects of the overall research effort in mental health are identified:

(a) *Diversity*—work on many levels from many different approaches and by investigators from a variety of specialties is actively underway.

(b) *Recurrent* (and perhaps overemphasized) differentiation between basic and applied research.

2. Research activity in mental health has been highly concentrated in a relatively small number of major universities. It is pointed out that the typical viewpoint of the university community is different from the approach of those who are directly concerned with delivering services to patients; hence the research practitioner gap is, to a certain extent, foreordained.

3. The major share of systematic investigation on mental health problems is conducted by psychologists. This reflects the heavy stress placed on research competence in graduate training in psychology. The field of psychiatry, which in the minds of legislators and of the public is strongly identified with mental health, is relatively inactive in research. Social scientists have (as of the date of the report) had relatively little support for mental health research.

4. Significant areas of mental health research are identified. These include:

(a) *Basic research*—structure and function of the brain, relationship of brain activity to psychological process, biochemistry of mental illness, implications of new findings in genetics in relationship to mental illness, psychological research related to cognitive and perceptual process and to language and communication, studies of normal personality development, studies of group process and interpersonal relations, social epidemiology of mental disorders, family role in mental illness.

(b) *Applied research*—primary prevention (mental health education; role of schools; effects of major societal adjustments such as introduction of automation, desegregation, emergence of urban problems); care and treatment (evaluation of new drugs; development of alternatives to hospitalization for chronic patients); administrative patterns.

5. As of the date of the report, more than half of the total outlay for mental health research came from the Federal Government, mainly from NIMH. The following "implicit policy" with respect to granting of research funds was formulated:

(a) Research policy is predominantly influenced by people trained in research rather than by practitioners responsible for treatment institutions.

(b) Prime criterion for awarding a grant is the scientific competence of the investigator rather than his official position or prestige.

(c) Research funds are to be used for the production of knowledge only and are not to be diverted to meet other needs. The implications of this are:

(1) There is undue emphasis on the single project rather than on total research needs.
(2) Administrating institution has limited and only nominal control over funds.
(3) Funds are allocated on a directly competitive basis with minimal consideration of regional distribution or spread through various disciplines.

(d) The development of multiple sources of support for research is encouraged.

6. The following problems and issues of the current research enterprise are explored:

(a) The concentration of mental health research in a small number of major universities has the following implications:
(1) It accentuates the focus on specific projects rather than broad research needs.
(2) It dislocates much of the normal scholarly activities of the university, forces universities to become inordinately dependent on grant funds, impels investigators to devote much of their time to the pursuit of grants, etc.
(3) It generates a maldistribution in the allocation of research support, with virtually none of it going to Southern states or to local and regional colleges.
(4) The intellection tradition of the university is reflected in the focus of mental health research; by the same token, many practical problems are neglected.

(b) The split between researchers and practitioners is a reflection of their differing biases, goals, work styles. The practitioner has a sense of urgency with respect to the needs of his patients; this is at variance with the long-term, slow-moving orientation of the researcher. Even when researcher and practitioner work together on the same problem, little mutual understanding is achieved.

(c) The public conception of mental health research tends to focus on crash programs which will produce dramatic breakthroughs (in the manner of the Salk vaccine for polio). There is inadequate public understanding of (and hence political support for) the necessity for the long view in planning and supporting research.

(d) Mental health research is currently overdependent on the Federal Government. What is needed (at the time of writing) is not only more research money, but, perhaps more important, more funds to train research scientists. If Federal agencies undertake to fund such training programs, this would constitute even further usurpation by the Government of the role of the university.

7. The following strategies are proposed for expanding and strengthening the research effort on mental health problems:

(a) There should be support for flexible and experimental programs of stimulating research in many different areas and settings.
(b) Efforts should be made to increase contacts between researchers and practitioners so as to increase mutual understanding of each other's problems and approaches.
(c) There is a general need for long-term research support.
(d) There is an urgent need to expand and intensify basic research in mental health.

142

RESEARCH SURVEY: MENTAL HEALTH

Planned change
Community research

COMMISSION REPORT

Joint Commission on Mental Health of Children. *Crisis in child mental health: Challenge for the 70's.* New York: Harper & Row, 1969.

Purpose

The Commission was authorized by the United States Congress to report on the mental health needs of children in this country and to suggest creative and imaginative changes in the major child-serving institutions relative not only to the

treatment of abnormal behavior, but also to its prevention and to the enhancement of normal development.

Method

The findings and recommendations of the project are based on an interweaving of speculative analysis with an extensive collection of statistics and other pertinent data. Thirteen national professional associations cooperated in the work of the Joint Commission; more than 500 of the country's leading authorities on early childhood, adolescence, and the young adult were enlisted to participate on task forces, substantive committees, and in the collection of information in specialized areas.

Findings and Conclusions

1. While proclaiming we are a nation devoted to its young, and while great strides have been made toward recognizing the needs of children and youth, our child-oriented programs are insufficient. They are piecemeal, fragmented, and incomplete in serving all those in need. They have failed to commit our vast resources to promote healthy development; we have yet to devise a maximizing strategy. Specifically:

(a) The nation has no unified commitment to its children and youth.
(b) The nation gives no real help in child-rearing until a child is badly disturbed or disruptive in the community.
(c) The nation still imposes on its young the psychological repercussions of poverty and racism.
(d) The nation has still to fill the gap between knowledge and action.
(e) The nation continues its planning and programming largely around the concept of treating, rather than preventing, mental illness.
(f) The nation has yet to develop adequate mental health services and facilities for all children and youth, regardless of race and economic circumstances.

2. The report proposes that if we are to optimize the mental health of our young and if we are to develop our human resources, every infant must be granted the right:

(a) To be wanted.
(b) To be born healthy.
(c) To live in a healthy environment.
(d) To the satisfaction of basic needs.
(e) To continuous loving care.
(f) To acquire the intellectual and emotional skills necessary to achieve individual aspirations and to cope effectively in our society.
(g) To receive care in facilities which are appropriate to their needs and which keep them as closely as possible within their normal social setting.

3. The major recommendations of the Joint Commission are presented under several headings:

(a) A child advocacy system, entailing the establishment of councils at national, state, and local levels, with stated purposes and functions, and with adequate staff and organizational structure.
(b) Community services and programs of a supportive, preventive, and remedial nature, including:
  (1) Physical and mental health services, such as: family planning, systematic prenatal care, pediatric and mental health services, school health and mental health programs, college mental health programs, mental health services for the clergy, remedial health and mental health services.
  (2) Assistance, employment, and environmental programs, including: employment and training, income maintenance, and housing.
  (3) Social services, including: programs for the preschool child, adoption and foster care, institutional care, protective services, vocational rehabilitation, probation services, school social services, family, marital, and premarital counseling, homemaker services, consumer education.
  (4) Education, including: preschool educational programs, concern for mental health in the school environment, and expanding opportunities for higher education, special education, resource centers for studying crisis conditions and colleges, school-community relations, education of minority group children.
  (5) Work, leisure, and preparation for adult roles, including: consideration of leisure activities, participatory activities, vocational readiness programs, vocational education, youth work-training programs, vocational readiness for the handicapped, retarded, delinquent, and severely disturbed, youth employment.

(c) Research, both basic and applied, in a national climate that optimizes individual productivity. The research should be methodologically sound, multivariate, sponsored, and well staffed. Recommended areas of research include:
  (1) Program research and evaluation.
  (2) Mental illness and emotional disorders.
  (3) Biological research related to mental health.
  (4) Birth control.
  (5) Development of infants and young children.
  (6) Education.
  (7) Adolescence and young adulthood.
  (8) Work.
  (9) Disadvantaged children and youth.
  (10) Foster care.
  (11) Family research.
  (12) Manpower.
(d) Manpower and training, covering such areas as:
  (1) Federal provisions for manpower and training.
  (2) Medical personnel for services to the mother and young children.
  (3) Manpower and service to adolescents.
  (4) Family specialists.
  (5) Teachers.
  (6) Foster care.
  (7) Child care workers for institutionalized children.
  (8) Clinical manpower and training.
  (9) Manpower and training for reeducation type schools.
  (10) Paraprofessionals.
  (11) Future manpower and training needs for local services and child development centers.

4. In support of, and elaborative of, the thinking that produced the comprehensive set of recommendations cited were a series of special studies reported in chapters entitled as follows:

(a) Contemporary American society: its importance in the mental health of children and youth.
(b) Contemporary American society: its importance in family life.
(c) Poverty and mental health.
(d) Children of minority groups: a special mental health risk.
(e) Emotionally disturbed and mentally ill children and youth.
(f) Social-psychological aspects of normal growth and development: infants and children.
(g) Social-psychological aspects of normal growth and development: adolescents and youth.
(h) Education and the mental health of children and youth.
(i) Employment: problems and issues related to the mental health of children and youth.
(j) Research.
(k) Human resources and human services.

143

RESEARCH SURVEY: MENTAL HEALTH

Planned change
Change measures

COMMISSION REPORT

Joint Commission on Mental Health of Children. *The mental health of children: Services, research, and manpower.* New York: Harper & Row, 1973.

Purpose

The several projects reported on in the volume have the combined purpose of studying and making recommendations on issues of research; manpower; rehabilitation; treatment and prevention; organization, administration, and financing; and clinical work—all as applied to childhood mental health.

Method

As with other projects of the Joint Commission on Mental Health of Children, the approach em-

ployed entailed a combination of empirical study with opportunities for the deliberative analysis of data leading toward the formulation of sets of recommendations.

Findings and Conclusions

1. Recommendations regarding *research* include the following:

(a) Establishing and preserving, as a matter of highest priority, a productive and creative national research climate.
(b) A national eclecticism in the support of research.
(c) The protection of the work of basic scientists and scholars.
(d) Support for new as well as established researchers.
(e) Support for the development of delivery techniques and systems in child mental health services.
(f) Inclusion of evaluative and innovative demonstration projects.

2. Recommendations regarding *manpower* are implicit in a series of discussions relative to recruitment, development, and utilization, and the relationship of manpower problems to the clarification of the goals that child mental health programs should be striving toward.

3. Recommendations regarding *rehabilitation and treatment* are discussed in terms of:

(a) Screening, consultation, and referral centers.
(b) A preschool home training program.
(c) Special day school programs.
(d) The adolescent and young adult rehabilitation center.
(e) Evaluation.

The needs of Indian children, of Negro children, and of Spanish-speaking children in the New York City area were covered in special studies.

4. Recommendations regarding *prevention* include reference to:

(a) Prenatal care.
(b) Work with new mothers.
(c) Changing patterns of medical care.
(d) Services for the one-parent family.
(e) Accident prevention at the preschool level.
(f) Drug programs in adolescence.
(g) Programs affecting child abuse and unwanted children.
(h) Research possibilities.
(i) Child allowance for poor children.
(j) High quality rather than minimal quality standards.
(k) Information dissemination strategies.

5. Recommendations regarding *organization, administration, and support* of services are seen as falling under four categories, as follows:

(a) Establishment of a system of data gathering and analysis designed to permit a more effective management of service systems.
(b) Setting ground rules for a broad program of experimentation and demonstration in the development of new technologies of service and new patterns of organization.
(c) Setting directions for further research into the problems and patterns of operation of the current service system, and the means by which improved service systems can be brought into being.
(d) Establishment of a new institution designed to deal, on a long-range basis, with the problems of children and services to children, and to assist, on a continuing basis, in the implementation of the recommendations of the Joint Commission on Mental Health of Children.

These four areas of suggestion are treated in great detail, with accompanying factual material and related discussion.

6. Recommendations regarding clinical matters cover a diversity of considerations related to treatment, prevention, and optimal growth and development as applied to infancy, the preschool period, the grade school level, and the secondary school years.

144

PLANNED CHANGE
Research survey
Change process: social

COMMISSION REPORT

Joint Commission on Mental Health of Children: *Social change and the mental health of children.* New York: Harper & Row, 1973.

Purpose

The study was designed to appraise the effects of pertinent aspects of the changing social condition upon the mental health of children, and to propose measures deemed promising in coping with the task of achieving optimum mental health. Special attention is given to the problems of poverty and racism. The identification of constructive innovations and the ways of promoting change represented another interest of the investigators.

Method

An extensive bibliographic search was conducted by Commission staff as one phase of the effort to prepare materials for review by task force and other expert personnel employed on the project. Discussions and the consideration of special reports were employed to hammer out the analyses and recommendations that constitute the bulk of the final report.

Findings and Conclusions

1. The authors agreed that radical change and major investments are needed if American society is to provide its young people with the opportunity for mentally healthy lives.

2. Measures intended to improve the life of the poor and the quality of life in general range from economic and employment measures to the restructuring of our major social institutions. Supplementary recommendations by other groups who are engaged in studying particular problem areas are referred to as additional sources of suggestion. Nonetheless, detailed proposals relative to the poor are listed following a full factual presentation of conditions affecting children of the poor.

3. Recommendations for coping with problems of racial concerns are offered in greater detail to the extent of several score of concrete suggestions related to government action, educational and other community involvement, law enforcement, clinical services, and parent-child and child-rearing facilities.

4. In recognition of the difficulties of effectuating significant societal change, a chapter written by Ronald Lippitt is devoted to the process and directions for change. This chapter examines the barriers to change as existing in our assumptions, in our institutional and professional practices, and in the deficiencies in our knowledge and skill. Resources of readiness for change are considered as a counterbalancing force. Needed directions for change are next discussed in terms of priorities. A variety of possible innovations are cited. The proposals for program development are presented under the following headings:

(a) A design for youth involvement and participation:
  (1) The development and operation of a youth participation and citizenship program at the community level.
  (2) The development and operation of the youth organization program at the state level.
  (3) The development and operation of a national office of youth participation and citizenship.

(b) The education of the young for participation and growth into adult roles.
  (1) Putting human relations into the curriculum.
  (2) Learning through teaching.
  (3) Collaboration in the planning and management of the learning environment.
  (4) Preparation for adult roles.
  (5) Training for social problem solving.

(c) The coordination and integration of community socialization and educational services.
  (1) At the level of direct workers with the young.
  (2) At the level of policy and program leaders.
  (3) At the level of youth influentials.

(4) At the level of state and federal programs and legislation.

(d) Recruiting and training of volunteers and paraprofessionals.
  (1) The community volunteer bureau.
  (2) Leadership teams.
  (3) Mobility from volunteer to paraprofessional.
  (4) Developing professional, paraprofessional, volunteer teams.

(e) The inservice training of parents.
  (1) Community-wide family development council.
  (2) The parent communications coordinator in the school.
  (3) The intergenerational laboratory.
  (4) The family unit laboratory.

(f) Programs for the preschool child.
  (1) A large-scale system of day care.
  (2) A community-wide inter-agency mechanism for the leadership and coordination of child-care program development.

(g) The training of professional child and youth workers.
  (1) Undergraduate apprenticeship opportunities.
  (2) Interprofessional team experience.
  (3) Integrated field experience and class work.
  (4) The continuing job clinic.
  (5) Training for trainership.
  (6) Training the staff unit or job family.
  (7) Training materials for continuing special education.

(h) The self-renewal model—guidelines for the development and maintenance of the illustrative programs described above.
  (1) Long-range planning.
  (2) Mechanisms of research development and training.
  (3) Dissemination and utilization mechanisms.
  (4) Evaluative review.

5. It is suggested that the implementation of the numerous recommendations be viewed and sorted out according to the categories of persons having various roles to play in regard to their execution. Categories mentioned include: legislators and other federal and state policy makers, professional leaders, research and development specialists, and professionals interested in the development of new models of practice.

145

RESEARCH UTILIZATION: EDUCATION

Researcher-practitioner gap
Linkage measures

ANALYSIS AND SUGGESTIONS

Joly, Jean-Marie. Research and innovation: Two solitudes? *Canadian Education and Research Digest,* 1967, 2, 184-194.

Purpose

The author's purpose is twofold. First, he attempts to answer the question: is there, or is there not a considerable delay in the application of educational research to educational practices? Second, he offers a series of suggestions for bridging the gap between research and practice, and gives principles concerning the nature of education that must be kept in mind when one tries to bridge a gap.

Method

The ideas in this article are based on the broad experience and observations of the author.

Findings and Conclusions

1. Although there may be differences of opinion about the extent of the gap between the results of educational research and educational practices, the author feels that a significant estrangement exists. He attributes the difference of opinion to different definition of terms, observation of different samples, and the difficulty of establishing with certainty what actions, what policies, and what innovations are direct applications to specific research findings.

2. Why the estrangement? What are the basic

factors that have led educational research and educational practice into "two different solitudes?" To some extent the estrangement may be unavoidable, and may even be desirable for the following reasons:

(a) Too few excellent persons are engaged in research careers, too much reliance has been placed on individual efforts, and too little has been done to set up interdisciplinary teams to deal with the complex issues in education.
(b) Little or no attention has been given to the necessity of repeating experiments in order to demonstrate the reliability or unreliability of the results published by the original investigator.
(c) Education is responsive to moral and political pressures as well as scientific ones.
(d) It is difficult to establish and maintain a fruitful dialogue between researcher and practitioner. The competent research person has by necessity acquired a high level of specialization, with the attendant recondite concepts and esoteric vocabulary. The educator is not particularly well prepared to listen to him.

3. A dialogue between researcher and teacher or administrator thus brings together most, if not all, of the conditions that will guarantee complete absence of communication: divergent interests, mutual mistrust, use of different language.

4. There are several ways of bridging the gap between researcher and practitioner.

(a) *Action research*—a group of teachers tackle a problem in the hope of devising an effective solution; a research specialist serves as a consultant or team member. This strategy implies the realization of three objectives: usable results of fundamental research will be incorporated in the behavior patterns of teachers; solutions adapted to local conditions will be devised; and personal and professional growth will take place in the team members.
(b) *Establish a linking organization*—an organization such as the educational laboratories could be created where public school teachers and administrators, university professors and administrators, representatives of State departments, teachers' associations, business, and industry are brought together.
(c) *Establish an educational program based on involvement*—an organization similar to the Ontario Institute for Studies in Education, which undertakes the threefold task of graduate instruction in education and allied sciences, research, and development. Both the staff and students are expected to participate in all three types of work.

5. Principles to keep in mind:

(a) Fundamental research, development, and dissemination are three distinct jobs. When successfully conducted, research produces understanding; development results in proven, practical procedures; and products and dissemination lead to adoption of the products and procedures.
(b) All three jobs are essential to the progress of education as a social endeavor. Without basic research, our schools would fall victim to high-pressure salesmanship, faddism, and quackery. Without development, research in education would become at best an elegant form of mental gymnastics and at worst an expensive parlor game. Without dissemination, research and development are pointless.
(c) All three jobs are essential to education as a profession. It is through their knowledge of basic research results that teachers can operate more successfully as professionals.
(d) Entrusting all three tasks, or even two of them, to the same persons is not necessarily an ideal solution. Since so few competent research persons are at present available it might not be wise to burden them with development of dissemination duties.

6. The author concludes with a warning against the adoption of innovation without properly researched study of the effects of the innovation.

146

ORGANIZATIONAL CHANGE: BUSINESS

Organizational climate
Resistance to change
Attitude toward change

ANALYSIS AND SUGGESTIONS

Judson, Arnold S. *A manager's guide to making changes.* New York: Wiley & Sons, 1966.

Purpose

The book presents a series of strategies for implementing change in a business organization. It is essentially a how-to-do-it presentation.

Method

The method is analytical, backstopped by generous citation of case material.

Findings and Conclusions

1. Before introducing and attempting to implement change, the manager should clarify the following:

(a) What is to be accomplished and why?
(b) What will be the value of the change?
(c) What methods will be used to accomplish the objectives?

2. Typically, change affects people in three ways:

(a) The behavioral effects represent the alterations they must make in their work habits.
(b) The psychological effects represent changes in the ways in which they relate to and regard their work.
(c) The social effects represent the changes in established relationships with coworkers and with the organization.

3. The individual's attitude toward a change is affected by the following factors:

(a) His predisposed feelings about changes of any kind.
(b) The extent of his feelings of insecurity.
(c) Any prevailing cultural beliefs and norms that might be in conflict with the change.
(d) The extent of his trust in his management, his union and his work group.
(e) Objective historical events relevant to the change.
(f) His specific apprehensions and expectations about the particular change.
(g) The manner in which the change is introduced and implemented.

4. The response to proposed change can range from active, outright resistance, through more subtle, passive forms including indifference, to acceptance.

5. In attempting to assess the extent of organizational resistance to change, management should, in effect, construct a balance sheet in which potential losses (as perceived by those affected) are weighed against potential gains.

6. Among the strategies for minimizing resistance are: compulsion, persuasion, dispelling fear, developing a full understanding of the change, appropriate timing in scheduling the change, involvement of those affected in planning and implementing change, avoiding implications of criticism, and flexibility in installing change.

7. The role which an individual occupies within an organization affects the way in which he perceives a proposed change, as follows:

(a) The originator of the change will be the most optimistic, the least patient, and the least objective.
(b) The manager will be the most objective; he also will be the person whose course of action determines the success or failure of the change.
(c) The supervisor will be more oriented to the difficulties attendant upon the change than to its potential benefits.
(d) If there is a staff specialist involved, he will tend to share the positive bias of the originator. He is likely to be insensitive to the psychological and social effects of the change.

8. A systematic approach to making change calls for the following steps: analyzing and planning the change, communicating about the change,

gaining acceptance of the required changes in behavior, making the initial transition, consolidating, and following up.

9. In order that change be managed effectively, the following attributes of organizational climate are required:

(a) Change is considered a continuing, normal activity.

(b) Line managers and supervisors are responsible for introducing and implementing change.

(c) Senior management does a minimum of interfering, giving maximum freedom of action to those to whom the responsibility for change has been assigned.

(d) Among managers and supervisors, task accomplishment takes precedence over immediate personal and political objectives.

147

COMMUNICATION BLOCKS: HOSPITAL

Organizational factors

EMPIRICAL STUDY

Julian, Joseph. Compliance patterns and communication blocks in complex organizations. *American Sociological Review*, 1966, 31, 382-389.

Purpose

Compliance involves the relationship between the different means of influencing behavior and the kind and amount of effect generated by these means. This article examines the extent to which different compliance patterns are related to the degree of communication obstacles between hospital patients and staff.

Method

HYPOTHESIS BEING TESTED

The author expected general hospitals to have predominately normative power structures and patients who demonstrated a positive attitude toward the hospital, whereas hospitals with a more custodial orientation would be characterized by a more coercive power structure and patients who had a relatively unfavorable attachment to the hospital.

HYPOTHESIS

As the compliance relations of the hospitals move along the continuum from normative to coercive, the degree of communication blockage increases.

SAMPLE

A total of 183 patients in five hospitals (a university hospital, a medium-sized general voluntary hospital, a large general voluntary hospital, a tuberculosis sanitorium, and a veterans hospital within the metropolitan area of a large Midwestern city) were interviewed. These patients represented an availability and density sample in the selected hospital units who were willing and intellectually able to participate. In general, the patients in the five hospitals were similar in age, sex, marital status, number of children, range and distribution of occupation.

DATA COLLECTED

Data were obtained on: (1) patients' perception of the frequency with which different types of sanctions were utilized;* (2) the extent to which patients were negatively involved, neutrally involved, and positively involved in the organization; and (3) patients' reports of obstacles to the contact and transmission of messages between patients and staff. The principle instrument was a flexible, combination interviewer-respondent administered questionnaire.

Findings and Conclusions

1. The data revealed the utilization of normative power in all five of the hospitals, with coercive

*Normative sanctions involve persuasion, manipulation, or suggestions based on the allocation and manipulation of social symbols, rewards, and deprivations; coercive sanctions refer to the application of physical force and controlling through force.

sanctions less frequently reported in the university and general hospitals than in the TB sanitorium and veterans hospital.† Over 70 percent of the patients had a positive orientation to the normative sanctions employed. The data indicated that normative hospitals had fewer communication blocks than normative-coercive hospitals.

2. The author suggested that normative-coercive organizations had more communication blocks because their goals were oriented more toward control and/or coordination than toward patient involvement. He further generalized that blocks in downward communication occur more often in organizations with relatively higher degrees of both coercion and structure.

3. Julian concludes that restriction of information and communication is related to the effectiveness of organizations that utilize coercive sanctions and generally exercise relatively high degrees of control to obtain their objectives. Conversely, free flow of communication is related to the effectiveness of organizations that utilize normative sanctions and exercise relatively low degrees of control.

†This meant the hospitals were classified as either normative or normative coercive.

148

PLANNED CHANGE: EDUCATION
Innovation

ANALYTICAL MODEL

Jung, C., and Lippitt, R. The study of change as a concept in research utilization. *Theory into Practice,* 1966, 2(1), 25-29.

Purpose

The purpose of this article is to answer the question: how can scientific knowledge be used to contribute to an orderly and creative process of planned change in education? Starting with the assumption that research findings seldom provide direct answers about what the educator should do in dealing with a problem, the authors seek to show how educators can derive implications from research findings that might help meet specific classroom situations.

Method

The key question, as stated above, was broken down into its major elements—education, scientific knowledge, planned change, and utilization. Each of these was defined. A summary definition of each is as follows:

1. *Education*—stimulating motivation and maintaining good learning experiences for children in the context of the total school system, not just the classroom. Three kinds of awareness and knowledge are necessary in order to help improve educational activities: (a) diagnosis of the priority needs for change; (b) awareness of existing innovations as alternatives for action toward change; (c) knowledge of the resources available to work toward change.

2. *Scientific knowledge*—this includes theory, research findings, and research methodologies.

3. *Planned change*—the inclusion of certain basic problem-solving phases in adapting to an action concern. These include: (a) identification and diagnosis of the concern; (b) the retrieval of relevant knowledge and derivation of implications from that knowledge; (c) formulation of action alternatives; (d) feasibility testing of selected action alternatives, including training and evaluation; (e) and adoption and diffusion of successful alternatives.

4. *Utilization*—both a process and a structure. The process: a flow of information from basic research, to development of applications, to action, to dissemination by the practitioner, to use by the consumer. The structure: the organization of the roles of researcher, developer, practitioner, consumer, and linker.

The above definitions were combined into a model for educational change that represents the process of utilization. The core of the process is the problem-solving phases of planned change.

Findings and Conclusions

1. The model of research utilization for educational change demands collecting data about the educational setting. The methodologies of science can be borrowed by the practitioner and adapted as aids to gain this knowledge.

2. General research findings help teachers consider what kinds of things may be helpful to know about in the classrooms; the use of diagnostic tools helps them to determine more clearly what is happening in their own classroom groups.

3. It seems feasible that principals and other administrators could find similar use for systematic diagnostic tools, such as questionnaires and modified research instruments, to do a better job of securing accurate knowledge about their systems.

4. In addition to its potential diagnostic value, scientific methodology may be useful in providing the educator with evaluative feedback.

5. The model of research utilization to facilitate educational change is a process requiring supportive collaboration among people.

6. When given clearly defined tasks, social scientists might be especially helpful in these instances: contributing to the retrieval of appropriate theory and findings; reacting to the validity of derived implications; adapting methodology to creating diagnostic and evaluative tools; conducting values inquiry into the assumptions which underlie practices; creating training experiences for practitioners to develop skills required by innovations; and conducting new research on the process of research utilization itself.

7. The utilization of scientific knowledge for planned change in education calls for involvement of three roles—the roles of educators, of researchers, and of linkers between the first two.

8. Four major kinds of needs must be met in order to make progress toward answers to the issues raised above:

(a) There is a need for collaboration between researchers and educational practitioners.
(b) There is a need for the university setting and the school system each to explore the use of new functions to support the utilization process.
(c) There is a need to identify and develop training resources. A technology of training must be identified, developed, and made readily available.
(d) Research is needed on the process of utilization and on institutional structures which support it. Research is especially needed regarding retrieval of findings, derivation of implications, interpersonal skills for collaborating, skill-training technology, and action-research skills for field diagnosis and evaluation.

149

KNOWLEDGE CLASSIFICATION
Knowledge dissemination: social work

CONFERENCE REPORT

Kadushin, Alfred. Assembling social work knowledge. In *Building social work knowledge: Report of a conference.* New York: National Association of Social Workers, 1964, pp. 16-37.

Purpose

Underlying any program of research utilization is the organization of knowledge and research findings. It is necessary to know what knowledge is possessed. It is necessary to collect and sort out the data, separate fact from fantasy, knowledge from guesswork, speculative inference, however logical, from valid conclusions. In this article, the author advocates that a "serious" encyclopedic inventory of social work knowledge be made available for practitioners.

Method

Kadushin takes a specific subject area from the field of social work and shows how one might make a comprehensive survey of the literature to determine what is known about it and the differential levels of validity with reference to knowledge available. He begins by categorizing the knowledge available into three major divisions: (1) social policy and administration, (2) growth and behavior, (3) social work methods, and then reviews available knowledge in each of these areas. He

gives an actual example of the type of inventory he advocates.

Findings and Conclusions

The author's concluding paragraph neatly summarizes his plea:

> The point is that systematic reviews of the literature regarding specific services, specific concepts, specific skills, undertaken under the direction of some central group, proposing some flexible commonality in approach are feasible, are worth the effort involved, can give us what we need and do not now possess—a comprehensive, authoritative statement of our knowledge base, and an equally important perspective on our knowledge. Such material can act as a guide, a stimulus, a brake to our theoretical attempts at delineating theoretical structures . . .

150

KNOWLEDGE DISSEMINATION: PSYCHOLOGY

Dissemination techniques

ANALYSIS

Kaplan, Bert. Dissemination of primary research data in psychology. *American Psychologist*, 1958, 13(2), 53-55.

Purpose

To discuss the implications of the development of microreproduction techniques to the dissemination of primary research data in psychology.

Method

The ideas presented in this article are based on the author's own intellectual analysis.

Findings and Conclusions

1. With the advent of microreproduction techniques, and especially the development of the microcard, publication by psychologists is no longer dominated by the economic factors of high-cost letterpress publication and the resultant scarcity of journal space, high-rejection rate, abbreviation of articles, and book publication according to sales potential rather than scholarly value.

2. Among the many possible solutions which microcopy techniques hold for publication problems is the development of easy access to original research data which usually is stored so as to be virtually inaccessible.

3. Psychology has been very wasteful of its empirical materials:

(a) Data are often inadequately exploited. Researchers are often content to skim data for what is most easily available and discard the remains rather than squeezing out every last bit of meaning from their data.

(b) Data are not shared among researchers who share common interests. Rather, a highly individualistic pattern of data utilization has emerged in which data are regarded as private property and the pattern is set for one investigator or team to analyze each set of data, which they discard when finished. But psychological data are often so complex that they defy the efforts of any one person to comprehend.

4. As a result of these wasteful practices, frequently one researcher has just the kind of material that someone else needs; sometimes hundreds of workers around the country are frustrated in their desire to work on particular problems because they lack funds and facilities to collect the necessary data; while at other, generally larger and richer, organizations these needed data may be lying around unused.

5. The author discusses the activities of the Committee on Primary Records in the Division of Anthropology and Psychology of the National Academy of Science's National Research Council established in 1955—

(a) the development of special categories of re-

search data which could be most useful to others; and

(b) the determination of what the best organization of data publication channels might be.

6. To date they have found that: (a) generally, workers in child development, social psychiatry, personality, clinical psychology, and testing are the most enthusiastic about the prospect of having raw materials accessible, while experimental psychologists see little value in it for themselves; and (b) there is wide agreement that data to be published should be chosen with great care and editorial wisdom.

7. Three distinct patterns for the publication of primary records may be identified:

(a) Researchers with data to disseminate contact a microtext publisher and make individual arrangements for publication.

(b) Individuals or groups initiate highly specialized series.

(c) Professional societies sponsor the development of stable publication series.

8. One other possibility offered by microreproduction techniques is that of combining a letterpress journal of contemporary abstracts, somewhat more extended than offered by psychological abstracts, with a supplemental service providing, on order, extended versions of the papers on microcards.

9. These proposals may not make great headway until inexpensive microcard readers are developed and the new techniques have gained wider acceptance among psychologists.

10. In conclusion, the author states: "One thing is certain. The flow of information in psychology will increase many times in the next few decades, and radical new solutions will be required if the information psychologists generate is to be retained, organized, and utilized" (p. 55).

151

INNOVATION DIFFUSION
Adopter characteristics

CASE STUDY

Katz, Elihu. The social itinerary of technical change: Two studies on the diffusion of innovation. *Human Organization,* 1961, 20, 70-82.

Purpose

On the assumption that the itinerary of change has been ignored (note that the study was published in 1962), the author undertakes to trace the movement of a given new practice, over time, through specific channels of communication, within a social structure.

Method

A comparative analysis was made of two studies: one of how hybrid seed corn gained acceptance among farmers in two Iowa communities; the other of how physicians in four communities responded to the availability of a new "miracle" drug (gammanym). Both new products were highly recommended by competent scientific authority, both were of central importance to the groups for whom they were intended, both were capable of producing results which could be readily measured and seen, both could be adopted on the installment plan rather than on an all-or-nothing basis, and both had the potential of economic profitability to the adopter.

Findings and Conclusions

1. For both groups, the interpersonal network of communication played an important role in the diffusion process.

2. Those who were audacious in terms of being early adopters were conservative in terms of the degree of their first use of the innovation; late adopters could be bolder because they could depend on the accumulated experiences of the innovators.

3. Availability of information concerning an innovation does not assure its adoption.

4. Both farmers and physicians first heard about innovation through salesmen. For farmers, signifi-

cant sources of information were neighbors; for physicians, professional journals, and colleagues. Commercial sources inform, informal sources legitimate.

5. For both groups, early adopters had more contact with the outside world. The farmers read more farm journals, made more trips to the city, and to county fairs; the physicians read more medical journals, attended more out-of-town medical meetings.

6. Early adopters among farmers belong to more formal organizations; among physicians, they were more integrated in informal friendship, discussion, and advice networks.

7. In both groups, the early adopters were less tradition bound, tended to be younger, more affluent.

152

INNOVATION CHARACTERISTICS
Adoption factors

ANALYSIS

Katz, Elihu. The characteristics of innovations and the concept of compatibility. Paper presented at Rehovoth Conference of Comprehensive Planning of Agriculture in Developing Countries, Rehovoth, Israel, 1963.

Purpose

The characteristics of the "item" to be diffused affect its rate of adoption. There has been some difficulty in developing generalizations about the characteristics that are most influential in the adoption process. In this article, the author explores several different characteristics that seem to emerge from past research findings as influential effectors of adoption and utilization.

Method

The ideas in this paper are based on the broad experiences and observations of the author.

Findings and Conclusions

1. Most "items" can be classified as material (things) or nonmaterial (ideas). It is readily apparent that it is much easier to gain acceptance of things than ideas.

2. *Factors Affecting Adoption.*

(a) *Communicability*—the more readily the utility of an "item" can be explained and demonstrated, the greater the probability of adoption.

(b) *Pervasiveness*—the more limited and more readily apparent are the ramifications of the item's adoption, the greater the probability of adoption. In other words, the less pervasive the greater the probability of adoption.

Katz hypothesized that an innovation high in communicability and low in pervasiveness would be readily adopted by those well integrated in the social system by virtue of the greater influence of interpersonal communication with other members of the social system. On the other hand, an innovation high in pervasiveness would be more likely accepted by an individual less closely bound by the norms of the relevant social system.

(c) *Risk*—two factors reduce the amount of risk involved in innovation adoption. *Reversibility,* or the more easily the status quo can be restored, reduces risk. The more *divisible* (the ease with which an innovation can be adopted on the installment plan), the less risk and greater the probability of adoption.

(d) *Profitability*—the greater the observable profit, the greater the probability of adoption.

3. *Compatibility.*

The aforementioned concepts are in turn related to their compatibility with the values of the potential adopters. The adopter must perceive the innovation as compatible with his values concerning risk and profitability before the innovation is adopted.

Any agent of change must understand how the potential adopters see the innovation. A primitive pretest in which potential adopters are interviewed

in some depth concerning the proposed innovation and then observed while trying it out may be the best technique for determining the compatibility of a given innovation with the values of the adopters.

4. *The Item and the Unit of Adoption.*

In this section Katz considers the effect of whether an individual or collective decision is required for innovation adoption. While some social systems favor more individual action, others *prescribe* adoption behaviors. Other things being equal, an innovation is more likely to be accepted when it "requires" the kind of adopting units which are "favored" by the culture or social system.

Campaigns seeking acceptance for innovation are more likely to succeed if they are addressed to the appropriate units of adoption.

5. *The Item and the Social Structure.*

Innovations require a certain distributional structure. Some structures are more compatible than others for innovation dissemination. The structure of the system can either facilitate or hinder the flow of innovational information.

Social relations condition the acceptance of innovation by virtue of their function: (1) as anchorage points for shared values; (2) as units of adoption; (3) as networks of interpersonal communication; and (4) as allocators of differentials in social role, social control, and social support.

153

CHANGE IN ATTITUDES
Communicator influence

EXPERIMENTAL STUDY

Kelman, Herbert C. Compliance, identification, and internalization: Three processes of attitude change. *Journal of Conflict Resolution,* 1958, 2, 51-60.

Purpose

The experimental study was concerned with some of the conditions that determine the nature of attitude changes produced by communications on social issues.

Method

The specific content of the attitudes investigated in this study was in the area of race relations. The underlying assumption was that there are differences in the process whereby the individual accepts influences or conforms. These different processes were identified as compliance (an individual accepts influence because he hopes to achieve a favorable reaction from another person or group), identification (an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or group), and internalization (an individual accepts influence because the content of the induced behavior is intrinsically rewarding).

The subjects in the experiment were Negro college freshmen; the experiment was conducted in the spring of 1954, just prior to the announcement of the Supreme Court decision on desegregation in the public schools. The subjects were exposed to the following tape-recorded communication: if the Supreme Court rules that segregation is unconstitutional, it would still be desirable to maintain some of the private Negro colleges as all-Negro institutions in order to preserve Negro culture, history, and tradition.

The communication was transmitted by persons assuming a variety of roles: the president of the National Foundation for Negro Colleges, a senior and president of the student council in a leading Negro university; a professor of history in one of the country's leading universities; a white southern "ordinary citizen."

Each of the four communications was presented to a different experimental group. Preliminary testing indicated that a large majority of the subjects would initially oppose the message presented in the communication. There was also a control group that was not exposed to any communication.

After exposure to the communication, the subjects in each experimental group filled out attitude questionnaires designed to measure the extent of their agreement with the communicator. The

questionnaires were uniform with respect to issue relevance, but the conditions under which they were administered created differences with respect to surveillance and salience.

Findings and Conclusions

In the judgment of the author, the results of the experiment lent considerable support to the three hypotheses being tested:

1. Attitudes adopted from a communicator whose power is based on means-control will tend to be expressed only under conditions of surveillance by the communicator. The mediating process postulated is compliance.

2. Attitudes adopted from a communicator whose power is based on attractiveness will tend to be expressed only under conditions of salience of the subject's relationship to the communicator. The mediating process postulated is identification.

3. Attitudes adopted from a communicator whose power is based on credibility will tend to be expressed under conditions of relevance of the issue, regardless of surveillance or salience. The mediating process postulated is internalization.

154

CHANGE IN OPINIONS
Change process

ANALYTICAL MODEL

Kelman, Herbert C. Processes of opinion change. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 509-517.

Purpose

The author distinguishes among three different opinion change processes.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

Kelman identifies three processes of opinion change: compliance, identification, and internalization.

1. Compliance occurs when an individual accepts influence from another person or from a group because he hopes to achieve a favorable reaction from the other.

	Compliance	Identification	Internalization
	ANTECEDENTS		
1. Basis for the importance of the induction.	Concern with social effect of behavior.	Concern with social anchorage of behavior.	Concern with value congruence of behavior.
2. Source of power of the influencing agent.	Means control	Attractiveness	Credibility.
3. Manner of achieving prepotency of the induced response.	Limitation of choice behavior.	Delineation of role requirements.	Reorganization of means-ends framework.
	CONSEQUENTS		
1. Conditions of performance of induced response.	Surveillance by influencing agent.	Salience of relationship to agent.	Changed perception of values related to issue.
2. Conditions of change and extinction of induced response.	Changed perception of conditions for social rewards.	Changed perception of conditions for satisfying self-defining relationships.	Changed perception of conditions for value maximization.
3. Type of behavior system in which induced response is embedded.	External demands of a specific setting.	Expectations defining a specific role.	Person's value system.

2. Identification occurs when an individual adopts behavior derived from another person or a group because this behavior is associated with a satisfying self-defining relationship to this person or group.

3. Internalization occurs when an individual accepts influence because the induced behavior is congruent with his value system.

4. In the table above, Kelman summarizes the distinctions among the three processes.

155

RESEARCH UTILIZATION: MENTAL HOSPITAL

Innovation
Utilization factors

CASE ANALYSIS

Klein, Helen D. The Missouri story, a chronicle of research utilization and program planning. Paper presented at the National Conference of Social Welfare, May 1968.

Purpose

A summary of conditions necessary for research utilization and some impact of research in Missouri.

Method

The author draws her ideas from her own experiences and knowledge.

Findings and Conclusions

Conditions necessary for research being effectively used in practice are:

(a) It must be translated from research terminology into lay language.
(b) The implications for practice must be stated in clear cause-and-effect statements.
(c) The findings must be sound.
(d) The applicability to the specific local area must be unquestionable.
(e) There must be forceful, professional leadership to bring the information to the public.
(f) The total staff familiar with the findings must direct reports to grassroot levels.

2. When factual presentation shows the mentally ill can get well faster, remain well longer, and that the costs are less and that more people can be treated by one system than another, legislators and others will respond. In Missouri, this has resulted in beginning change from large State hospitals to small, local intensive care units.

3. Concomitant with this study, an effort was made to determine how research findings per se can be made more easily usable. More powerful and more pertinent studies, presentation in a less technical form for readers with less research sophistication, inclusion of implications for practice and many varieties of introductory or concluding summaries were the most frequent suggestions. One suggested innovation was a pocket-sized scientific reader's digest for review of interdisciplinary research from other periodicals and books.

156

ADOPTION PROCESS
Adoption lag

ANALYSIS

Klonglan, G. E., and Coward, E. W., Jr. The concept of symbolic adoption: A suggested interpretation. *Rural Sociology*, 1970, 35(1), 77-83.

Purpose

The purpose of the paper is to illustrate the place of symbolic adoption in the adoption process. By symbolic adoption, the authors mean the component of the adoption process during which the idea is accepted, in contradistinction to the use component in which the material object or practice is accepted.

Method

The concept is evolved analytically, with abundant reference to relevant literature.

Findings and Conclusions

1. By perceiving adoption as a two-phase process (symbolic and use), it is possible to derive new insights into the phenomenon of lag or disjuncture in the adoption process. This lag frequently occurs after symbolic adoption has taken place. The user may be deterred from completing the adoption process because of a variety of barriers: action or inaction of others involved in the adoption; a situational context which makes the timing of the adoption inappropriate.

2. The concept of symbolic adoption makes it possible to pinpoint more precisely the variables that have a bearing on the total adoption process. For example, the following hypothesis is advanced: sociological variables (such as congruence) will be most important in explaining symbolic adoption, whereas economic variables (such as profitability) will be relatively more important in explaining use adoption.

3. Decisions concerning rejection and discontinuance can be interpreted in light of the concept of symbolic adoption. There are two classes of rejection: symbolic rejection and trial rejection. Discontinuance of use of an innovation may contribute to the symbolic rejection by others, to the trial rejection by others, or to the discontinuance by others.

157

RESEARCH UTILIZATION: SOCIAL WORK
Research-practitioner relationships
Utilization deterrents

CASE ANALYSIS

Kogan, Leonard S. The utilization of social work research. *Social Casework*, 1963, 44, 569-574.

Purpose

Kogan traces the consequences and sequelae of several research projects undertaken by the New York Institute of Welfare Research to show that the impact and utilization of research varies according to the standpoint from which it is considered—whether as specific or as general, whether as a contribution to a specific decision-making situation or as a contribution to knowledge.

Method

The generalizations drawn by Kogan about research utilization stem primarily from personal experience and observation. The author gives

several examples from his period of service and then draws some concluding observations.

Findings and Conclusions

1. Examples of research studies and their utilization.

(a) *Studies of movement*—this was a series of studies carried out from 1945 to 1957 designed to attain a standardized method of measuring the results of social casework. Citing a bibliography on development, utilization, and appraisal of movement scales as evidence, Kogan asserts that this research was being used in a rather wide variety of institutions and organizations.

(b) *Study of the use of case records*—the institute conducted a study on records kept by caseworkers, concluding that the design and content of the case records should be determined primarily by their utility to the worker in serving the clients. Suggestions were made for modifications and improvement based on the data. The results from this study were discussed, but action on the recommendations was tabled. It was not till several years later that some changes were made, and these were after another study had been conducted.

(c) *Study of open-floor plans*—this investigation was designed to determine the acceptability of a new type of office plan. Employees involved in a trial setup were interviewed to determine their satisfactions with the new arrangements. The evidence was overwhelmingly negative. The findings from the study contributed to a practical administration decision to adopt an older, more conventional office plan. In this case the research was utilized immediately.

(d) *Study of short-term cases*—after reviewing the results of two different ways of handling short-term cases, the researchers found one method to be distinctly superior in achieving results. When patients were referred (social worker making the contacts) to another agency, 80 percent received service. When the caseworker chose to "steer" the client, only 40 percent received needed aid. The study revealed that steering, while less effectual, was the more common practice among social workers. This research went unheeded.

2. Although there are specific reasons for each instance of nonutilization there are some general factors that contribute to nonutilization of research findings.

(a) *The nature of the research and the research report*—several reasons for nonutilization can be subsumed under this heading: (1) the results and recommendation may be stated ambiguously and be so beset with conditions that they are not readily applicable, (2) the research itself may be of dubious quality, so that the resulting recommendations must be held in question, (3) the language of the report may be so technical that the flow of information to individuals who would make practical use of it is obstructed.

(b) *The user's characteristics and role power*—the motivation, capacity, and actual power of the practitioner to introduce change must be considered. Unless the users understand the research and are motivated to accept the findings and further have the power to implement it, there will be little opportunity to get the research into practice.

(c) *Interactions and transactions between researchers and user*—it is an accepted maxim that research has a better chance of being utilized if there have been cooperative efforts between the researcher and user at all phases of the research. Lack of cooperation is not only likely to prejudice users against the information in that particular study, but also is likely to widen the gap between user and researcher in general.

(d) *Setting within which the research and the potential application take place*—the organizational environment with its different programs, concern with costs and effects of modifications is likely to influence research utilization. Organizational variables are often overlooked, and they are often most influential in determining utilization of research.

158

RESISTANCE TO CHANGE: SOCIAL

Change process
Adopter characteristics

ANALYTICAL MODEL

LaPiere, Richard T. Adoption and the adopter. In R. T. LaPiere, *Social change.* New York: McGraw-Hill, 1965, pp. 174-212.

Purpose

This is a summary of a chapter in a textbook dealing with social change viewed from a broad historical perspective.

Method

Analytical, with an historical orientation.

Findings and Conclusions

1. Sometimes there are valid reasons for resistance to the adoption of innovation (the prior one didn't work out well, for example), but more frequently the resistance has covert bases beyond those expressed.

(a) There is a pervasive fear of the unfamiliar. "Fear of the unknown can even override the certainty of acute physical pain."
(b) Resistance may be based on moral sentiments, principles, and precepts, not always recognized by the resistors. (Refusal in India to kill and eat a sacred cow despite famine; resistance to birth control among Catholics despite problems of overpopulation.)
(c) Resistance is sometimes based on aesthetic values. (Resistance to use of hydrogenated vegetable oils in place of lard in cooking, cholesterol to the contrary notwithstanding, because the oil seemed tasteless and the pastries prepared with it seemed to lack texture.)
(d) Sometimes elaborate rationalizations are advanced as the basis for resistance, because the foregoing moral and aesthetic considerations are not recognized. For example, travel by train was once resisted on the premise that the human body could not survive traveling at the rate of 30 miles per hour.

2. There are, however, some less covert bases for resisting an innovation.

(a) It is often a threat to vested interests in skills and knowledge. (The availability of synthetic paints, and roller techniques of applying them have downgraded the position of painter.)
(b) It is seen as a threat to status.

3. "Widespread individual resistance to an innovation may become mobilized into organized opposition, of which the simplest form is that arising informally among the members of a residential community, an occupational grouping, or a social class." Our society abounds in examples . . . the Ku Klux Klan, the antivivisection movement, etc.

4. Certain characteristics of the adopter are identified.

(a) Conservative and successful persons tend to resist innovation. The person who is marginal and has nothing to lose will more willingly be an adopter.
(b) A person bent on upward mobility will often embrace an innovation in the hope that it will speed him on his way.
(c) Occasionally an adoption will be led by persons with prestige and then the innovation, through the halo effect, will spread. (The fact that in England in the late 19th century socialism was taken up by Shaw and other intellectuals gave the ideology a respectability it never achieved in America.)

5. The course of the adopter cycle may be traced as follows: initial resistance, accelerated acceptance once it is adopted, tapering off. The author takes the position that virtually no innovation, however drastic it may seem during its "up" phase in the cycle, really revolutionizes the affairs of man.

159

APPLIED SOCIAL RESEARCH
Research-practitioner relationship
Change agent
Research utilization: social

ANALYSIS

Lazarsfeld, P. F., Sewell, W. H., and Wilensky, H. L. (Eds.). Introductory chapter in *The uses of sociology*. New York: Basic Books, 1967, pp. ix-xxiii.

Purpose

The introductory article sets forth the intent and scope of the collection of articles on the uses of sociology.

Method

The types of contributions of the articles are grouped under six topics: (a) types of problems facing the client; (b) types of clients; (c) the role of sociologists; (d) resources of the sociologist; (e) the administrative setting; and (f) the social context.

Findings and Conclusions

1. The central focus of the volume is collaboration, or lack thereof, between clients and sociologists. The two central issues that the authors analyze are: (a) difficulties of translating practical issues into research problems; and (b) unavoidable intellectual gaps between research findings and advice for action.

2. Sociological contributions can be made to every phase of the social decision-making process, including the setting of goals as well as their implementation. The tradition of social service to individuals and families has been broadened to encompass the whole idea of community development. Organizational development, once considered the domain of the psychologist, is now shared with the sociologist, as are many problems in the political arena.

3. Thus, decision makers from many fields provide the clientele of sociologists. However, the uses vary from group to group.

4. The sociologist can play various roles, employing a variety of resources, meeting different types of problems. Among the roles discussed by the several contributors are those of staff member in nonacademic jobs, decision maker, teacher in specific professional situations, consultant to government, social critic, and communications specialist.

5. Specialized research techniques and awareness of sociological variables are mentioned as part of the resource equipment of the sociologist. Constructs that stand out in terms of reference by contributors include the notions of stratification, primary social relations, reference groups, and role conflict.

6. Issues relative to administrative settings are presented in four groups: (a) the problem of the *continuity* of the relation between the sociologist and the client; (b) the question as to the rewards derived from academic appointment; (c) the availability and use of outside funds; and (d) difficulties within the university.

7. The social context impinges on the relation between the sociologist and the client. There are different traditions and expectations of gain. Values differ, and there are questions of professional ethics. Problems may develop on methodological grounds. There are intraprofessional differences in emphasis on autonomous knowledge versus applied work. Field-induced studies create issues regarding the relation of sociologist to client.

8. The relation between decision making and sociological knowledge is presented with the conclusion that whatever fund of knowledge has been drawn upon, there comes the moment when one has to make the leap from knowledge to decision.

160

GROUP PROCESS: SOCIAL
Change dynamics
Group dynamics

ANALYTICAL MODEL

Lewin, Kurt. Quasi-stationary social equilibria and the problem of permanent change. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 235-238.

Purpose

The author analyzes the change process, suggesting three steps necessary for effecting real change.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

Basically, the change process involves three steps: unfreezing, moving, and freezing. The attitudes, beliefs, and practices that keep the individual or organization at the present level must be unfrozen. The individual or organization must move to a new level or mode of behavior, and then be frozen at this new level. Unless all three aspects of the change process are affected the change is likely to be only temporary.

161

CHANGE PROCESS: SOCIAL
Change in cognition, affect, and motoric action

ANALYSIS & SUGGESTIONS

Lewin, K., and Grabbe, P. Principles of reeducation. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 503-509.

Purpose

The authors outline principles related to the process of reeducation.

Method

The ideas in this paper are based on the broad experience and observations of the authors.

Findings and Conclusions

1. Reeducation affects the individual in three ways—

(a) it changes his cognitive structure, the way he sees the physical and social worlds, including all his facts, concepts, beliefs, and expectations;

(b) it modifies his valences and values, and these embrace both his attractions and aversions to groups and group standards, his feelings in regard to status differences, and his reactions to sources of approval or disapproval; and,

(c) it affects motoric action, involving the degree of the individual's control over his physical and social movements.

2. The authors suggest a number of principles to keep in mind when attempting to create changes in cognitive structures:

(a) Even extensive firsthand experience does not

automatically create correct concepts (knowledge).
(b) Social action no less than physical action is steered by perception.
(c) As a rule the possession of correct knowledge does not suffice to rectify false perception.
(d) Incorrect stereotypes are functionally equivalent to wrong concepts (theories).
(e) Changes in sentiments do not necessarily follow changes in cognitive structure.
(f) A change in action ideology, a real acceptance of a changed set of facts and values, a change in the perceived social world are different expressions of the same process. "Reeducation is only successful if a change in the system of which the individual is a part is also successful. If reeducation succeeds only to the degree that the individual becomes a marginal man between the old and new, nothing worthwhile has been accomplished."
(g) Acceptance of the new set of values and beliefs cannot usually be brought about item by item.
(h) The individual accepts the new system of values and beliefs by accepting belongingness to a group. The group provides a cushion for the individual. The acceptance of the new system is linked with the acceptance of a specific group, a particular role, a definite source of authority as new points of reference.

162

KNOWLEDGE UTILIZATION: SOCIAL SCIENCE

Researcher-practitioner collaboration
Resistance reduction

ANALYSIS AND SUGGESTIONS

Likert, R., and Lippitt, R. The utilization of social science. In L. Festinger and D. Katz (Eds.), *Research methods in the behavioral sciences.* New York: Dryden Press, 1963.

Purpose

The authors seek to identify ways in which social practitioners and all citizens can utilize the resources of social psychology to improve personal insight, policy making, program planning, and individual and group action.

Method

The paper is developed on the basis of the authors' analysis, based on their own experiences, the literature, and case material. They explore two major areas: the situation in which there is a desire to apply scientific knowledge discovered elsewhere to the solution of an existing problem, and the situation in which there is a desire to apply research procedures directly to help solve an existing problem.

Findings and Conclusions

1. With respect to using knowledge and theory derived from research carried out elsewhere, the following points are made:

(a) There must be motivation to seek and use scientific resources. If motivation does not exist, it must be stimulated by demonstrations of potentiality, by complacency shock, and other approaches.
(b) Operating problems must be redefined and reformulated so that the potential user can perceive the relevance of scientific research done elsewhere.
(c) The social scientist, functioning as change agent, must orient himself to the action problem as the practitioner sees it in order to do an intelligent job of selecting appropriate scientific resources for application to this particular situation.
(d) The social scientist should interpret data to the practitioner within the framework of behavioral dynamics.
(e) The social scientist must help the practitioner understand the methodology of research application by facing such questions as the comparability of populations, comparability of situational dynamics, extrapo-

CONTINUED

3 OF 5

lation of theoretical generalizations to different situations, and "experimental mindedness" in trying new solutions.

(f) The practitioner must be aided in interpreting, planning, and executing specific steps of action in his own situation. This requires creative and realistic thinking about "what would happen if," although the research which is being applied may be directed to quite a different level of questioning, such as "why things are the way they are."

2. With respect to situations in which research methods are applied directly to problems of organizations, the authors devote considerable attention to a description of how to set up an internal research department. Since this is of only secondary relevance to research utilization, it is not included in this summary. However, within the foregoing discussion, a section on "Assuring Use of Research Results" is highly relevant, and the following points are abstracted:

(a) Induce cooperative rather than defensive attitudes.
(b) Encourage participation of all concerned in planning and interpretation.
(c) Plan for a presentation of preliminary findings to help win acceptance of research results.
(d) Encourage the use of self-analysis techniques to promote the use of results:
  (1) State the results as objectively as possible.
  (2) Let the group itself work out the interpretation of data.
  (3) Recognize and work through resistances, not gloss them over.
  (4) Let the group set its own pace with respect to accepting and applying the findings.
  (5) Present the results in a positive atmosphere, emphasizing first the results which show what is being done well.
  (6) Provide opportunities to save face.
  (7) Present the results in simple, nontechnical language in order to help the group realize that the data deal with their situation and are not something belonging to the research organization.
(e) Use hierarchical sources of influence; enlist support of top management.
(f) Use data so that it presses for action.
(g) Appraise the use of research results by remeasurement.

163

CONSULTANT ROLE
Change process

ANALYSIS

Lippitt, Ronald. Dimensions of the consultant's job. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 156-162.

Purpose

The author explores the function of the consultant in the change process and identifies some of the major challenges in that role.

Method

The approach is analytical, with the perceptions drawn from the author's considerable experience in the field.

Findings and Conclusions

1. The consultation relationship is defined as a voluntary relationship between a professional helper (consultant) and a help-needing system (client) in which the consultant is attempting to give help to the client in the solving of some current or potential problem.

(a) The relationship is perceived as temporary by both parties.
(b) The consultant is an "outsider"—that is, not a part of any hierarchical power system in which the client is located.

2. The consultant's first task is to identify the difficulty, determine its source, and find out what is maintaining it.

(a) To accomplish this task, he needs both a systematic theory (such as: psychoanalytic theory, structure-function theory, learning theory, social conflict theory), and a diagnostic theory.
(b) Typical diagnostic orientations include:
  (1) An inappropriate distribution of power, too diffuse or too centralized.
  (2) Blockage and immobilization of productive energy.
  (3) Lack of communication between the subparts of the system.
  (4) A lack of correspondence between external reality and the situation as perceived by the client.
  (5) A lack of clarity or commitment to goals for action.
  (6) A lack of decision-making and action-taking skills.

3. The consultant must attempt to identify his own motivations for becoming involved in the helping relationship.

(a) He would do well to be aware that efforts to stimulate change are sometimes perceived as manipulative.
(b) Great sensitivity is required to determine when it is prudent to initiate change-making activities. Is it done on the basis of individual welfare? Group welfare? Institutional welfare?

4. The consultant should assess the client's motivations with respect to change.

5. He should assess his own resources for giving the sort of help that is needed.

(a) Can he provide continuity—that is, stay with the client to make sure his suggested improvements are soundly implemented?
(b) Does he have training and therapeutic skills to match his skill at diagnosis?

6. In establishing a consulting relationship, the following preliminary steps are suggested:

(a) The client group must be helped in developing awareness of its needs.
(b) A trial period, during which expectations are clarified, is recommended.
(c) The consultant should establish relationships with the total client organization and avoid getting trapped with subgroups.

7. Phases of the change process through which the consultant guides the client include:

(a) The development of a need for change.
(b) The establishment of a consulting relationship.
(c) The clarification of the client problem.
(d) The examination of alternative solutions and goals.
(e) The transformation of intentions into actual change efforts.
(f) The generalization and stabilization of a new level of functioning or group structure.
(g) Achieving a terminal relationship with the consultant and a continuity of change ability.

8. A successful process of consultation with an organization ends with at least three kinds of learnings:

(a) The organization has learned to cope more adequately with the problems which initiated the consulting process.
(b) The organization has learned how to function more adequately in clarifying future problems as they emerge and to seek outside help when needed.
(c) The organization has learned new techniques for maintaining organizational health.

ANALYTICAL MODEL

Lippitt, Ronald. Roles and processes in curriculum development and change. In R. R. Leeper (Ed.), *Strategy for curriculum change.* Washington, D.C.: Association for Supervision and Curriculum Development, 1965.

Purpose

In this article, Lippitt analyzes the change process in education. He outlines the problems confronting any change effort, presents a simple change model and suggests several factors that could help establish a favorable atmosphere for change.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. *Change Problems in Education*—Lippitt sees the following as the problem areas confronting educational change efforts:

(a) Most significant changes in education imply and require some changes in the attitudes, skills, and values of the practitioner in order to implement the change successfully. Lippitt asserts that this factor differentiates education from agriculture or industry where innovation adoption is often possible without deep attitude or value change. For example, the adoption of a new type of seed corn doesn't require a value change on the part of the farmer.

(b) A great proportion of the significant new inventions in education remain quite invisible, undocumented, inaccessible for consideration by potential adopters.

(c) A generally negative attitude surrounds the individual inventor. In education the teacher is often responsible for being her own inventor, thus stirring up negative attitudes toward herself when she is inventive.

(d) There is a significant lack of professional communication networks and change agents.

(e) Often colleague relations inhibit the trial and adoption of new ideas.

(f) There is a very significant lack of creative interdisciplinary work between teachers (practitioners) and the social science fields.

(g) There is lack of clear feedback to reinforce change efforts.

(h) There is a feeling among administrators that there will be reactions against experimentation in the larger community of parents, agencies, organizations, and boards of education.

2. *The Change Process*—after reviewing several models of change, Lippitt represents the change process as: identification, development, and diffusion. Feedback is a crucial factor in all three phases of the change process.

3. *Change at Different Hierarchical Levels*—the author suggests that there are different levels at which educational innovation can occur. There is danger in attempting to implement change through levels that are nonrelevant. The educational levels he outlines are: (a) the classroom level, (b) the school building level, (c) the school system level, (d) the community system level. Some changes require a system-level adoption before individual teachers can use the innovation in the classroom; others require only that the teacher be convinced of their value, and willing to experiment with use. The efficient implementation of educational changes requires an analysis of the organizational level at which the innovation must be adopted before it can be used.

4. *Factors Promoting a Favorable Atmosphere for Change*—according to Lippitt the following factors should help to promote a favorable attitude toward change in education within the next few years.

(a) The action of the government.

(b) The explosion in continuing education plans and opportunities.

(c) Development of materials available for teachers.

(d) Demonstration projects within schools and regions.

(e) Development of resource libraries and retrieval systems.
(f) Development of communication technology.
(g) Use of human aides.

165

RESEARCH UTILIZATION: SOCIAL

Research utilization characteristics
Utilization strategies
Change agent

ANALYTICAL MODEL

Lippitt, Ronald. The use of social research to improve social practice. *American Journal of Orthopsychiatry*, 1965, 35(4), 663-669.

Purpose

This paper explores the processes by which scientific knowledge and scientific personnel can be used to help develop and validate significant improvements in educational and social practice.

Method

The author draws upon his professional experience, particularly as program director of the Center for Research on Utilization of Scientific Knowledge (CRUSK) at the University of Michigan. Specific CRUSK projects are cited in support of the generalizations advanced.

Findings and Conclusions

1. Six patterns of use of scientific resources are identified.

(a) An action design can be developed by the retrieval of relevant research findings, an analysis of implications and the subsequent formulation (through brainstorming, for example) of a program design.
(b) An experimental program can be designed, tested for feasibility outside the system, and, if it proves successful, recommended for adoption.
(c) Creative innovations can be identified in a comparable practice setting and practitioner-to-practitioner communication can be improved.
(d) An organization or agency can contract with a professional team to collect diagnostic data relevant to a specific problem, analyze it, and provide feedback.
(e) Outside applied researchers can supervise a self-study process within the organization.
(f) Practitioners can be trained to be consumers of science and of scientific resources in order to be effective users of scientific knowledge.

2. The following special characteristics of research utilization in the social sciences (as distinguished from the physical and biological sciences) are cited:

(a) Adoption of significant new educational or social practices calls for changes in values, attitudes, and skills; hence a deeper personal involvement and potentially more problems of resistance.
(b) Changes in mental health or education are more likely to be adaptations rather than adoptions of the innovations of others. Innovation is a new pattern of behavior rather than a new thing (piece of agriculture equipment, new drug, etc.).
(c) The concept of "social invention" is not adequately developed. Hence, procedures for documenting and validating are sketchy or nonexistent; many creative new practices are invisible and inaccessible.
(d) The social practitioner gets very little feedback about the effectiveness of his adoption effort.
(e) There is very little impetus for the practitioner in education or mental health to take risks in searching for and using new resources.
(f) In the social practice fields, linkage is particularly inadequate between researcher and practitioner.

3. The foregoing analysis suggests some specific functions of the linking agent in the social practice fields.

(a) He must not only identify the appropriate knowledge sources but help the practitioner work through the implications of the knowledge for this specific setting.

(b) He must provide training to the practitioner group in diagnosis of problems and implementation of change.

(c) He must (in addition to linking researcher to practitioner) link creative practitioners to each other.

166

RESEARCH UTILIZATION: SOCIAL

Change agency
Linkage process

CASE STUDY-ANALYSIS

Lippitt, Ronald. The process of utilization of social research to improve social practice. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 142-146.

Purpose

The article sets forth and illustrates with case instances six patterns for utilizing social research in attacking specific social problems.

Method

The author's observations are based on a number of brief, but varied, experiences with problems of scientific utilization encountered by the Center for Research on the Utilization of Scientific Knowledge of the University of Michigan. The experiences related to such problems as delinquency control, educational motivation of culturally deprived children, and the productivity of work groups in government and industry.

Findings and Conclusions

1. Patterns of research utilization may be grouped under two broad categories: (a) those that bring into the "science consumer system" new knowledge and validated practice from the outside; and (b) those that develop scientific knowledge within the system, and then utilize it as a basis for improvement of practice.

2. Three "external" patterns are described as:

(a) Identifying the problem and retrieving information from the outside.

(b) Conducting an extra-system feasibility test of a design procedure to meet some social practice issue.

(c) Identifying creative innovations by practitioners and diffusing them to other communities, agencies, or organizations.

3. Three "inner" system patterns are:

(a) The organization and the researcher collaborate in collecting and analyzing diagnostic data that are fed back for sponsor's use.

(b) Applied scientists supervise self-study to train local staff members to collect and process data, interpret the findings, and spell out implications for change.

(c) Consumers of scientific resources are educated by training in scientific methods and concepts and by laboratory science courses.

4. Training of linking agents should include skills needed for utilizing these six patterns.

167

RESEARCH UTILIZATION: MENTAL HEALTH
Utilization factors
Utilization measures
Researcher-practitioner collaboration

EMPIRICAL STUDY

Lippitt, R., and Butman, R. W. *A pilot study of research utilization aspects of a sample of demonstration research mental health projects.* Final report for Contract No. PH-43651047. Rockville, Md.: National Institute of Mental Health, 1969.

Purpose

The stated purpose of the pilot study was: (1) to find out what happened to projects funded under the Title V grant program, in terms of such criteria as the development of program models, the continuation of the operation of the model after termination of the grant, documentation of the model in a manner suitable for diffusion and adoption, validation of the model through evaluation procedures, accessibility to inquiry from others interested in considering adoption; and (2) to develop a methodology and plan for more comprehensive exploration of Title V demonstration grants and other funded activities.

Method

Some 36 demonstration projects, distributed among five midwestern states, constituted the sample. For each project, the proposals were studied and site visits were carried out. The data thus gathered were analyzed in terms of the following questions: What is the meaning of "payoff" for a particular project? Which aspects of project design have the most important relationship to project payoff (that is, diffusion)? How widespread and deliberate is the preparation and planning for diffusion, and what relationship does this have to project payoff? (The process of analysis involved only 30 of the projects in the sample, six having been discarded for a variety of reasons.) In the analysis, the independent variables were information about planning, execution of demonstration, and involvement in spread effort. The dependent variables represented the diffusion that resulted after demonstration. In summarizing the results of their payoff analysis, the investigators organized their findings in terms of whether the project was carried out by an organization other than the sponsor (sponsor-host projects) or whether only a single service-delivering organization was involved (single-site project).

Findings and Conclusions

1. Sponsor-host projects place more emphasis than do single-site projects on research and validation as the means to prepare the results of demonstration for communication to target adopter organizations. The single-site project tends, instead, to be service oriented.

2. High payoff is more likely for sponsor-host projects: (a) when existing personnel are involved in the demonstration, (b) when there is little change in structure or roles, (c) when there is good coordination between personnel performing different functions or in different organizations, and (d) when this coordination is aided by training and/or opportunities for continuous communication. Single-site projects do not have comparable linkage problems; they are not usually required to use personnel in unfamiliar roles and they rarely have to coordinate with other organizations, except to borrow resources.

3. Pretesting does not contribute to payoff in either type of demonstration setting.

4. Perception of diffusability contributes to payoff in either type of demonstration setting.

5. The spread function is often performed in the sponsor-host condition; it is uncommon in the single-site condition.

6. When project personnel have an opportunity to share the innovation with others, high payoff is likely, whether or not the innovation has been documented or evaluated, and regardless of prior concern about spread.

7. High payoff is more characteristic of projects where key personnel remained after the funded period.

8. High payoff apparently occurs when personnel are available, when demonstration is easy to handle, when opportunities to promote use are available, when personnel are motivated to spread and when the energies directed toward spread are sufficient to capitalize on other conditions.

9. The following implications for future use of demonstration are cited by the investigators:

(a) Linkage of resources needs to be more numerous, better handled, and well thought out.
(b) All projects need to have more awareness of the needs of potential adopters and the means to assess and evaluate ways of communicating with them.
(c) Projects could benefit from a "feasibility of demonstration" analysis before the proposal is written or as the second step in a two-step proposal.
(d) Projects need continuing support of consultants throughout the operational period; these troubleshooters can aid with training, documentation of project, developing rapport between researchers and practitioners, planning and carrying out continuation efforts.
(e) Projects need help with planning and carrying out spread activities . . . starting in the planning phase of the project itself.
(f) Personnel may need some kinds of retraining experiences at the end of the project, to make the shift from operations to diffusion.
(g) Many of the above types of assistance could be provided by change agents developed within the funding agency or at least available to the funding agency.
(h) Interchange via conferences (of proposal writers, of persons focusing on the needs of demonstration projects) could resolve problems which tend to diminish payoff.

168

INNOVATION: EDUCATION
Diffusion measures
Attitude toward change

EMPIRICAL STUDY

Lippitt, R. and Fox, R. *Identifying, documenting, evaluating, and sharing innovative classroom practices.* Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1967.

Purpose

To identify innovative classroom practices; to develop criteria for evaluating the importance of a particular classroom innovation; to identify factors that impede or encourage sharing and adopting these practices.

Method

The experiment was conducted in two parts. The first procedure involved a questionnaire that asked teachers to nominate innovative colleagues and outline the practices which, in their opinion, made these nominees creative teachers. A method for evaluating these practices was developed by a team of social scientists on the basis of objective criteria. Thirty of the most promising practices were selected, written up in a Catalogue of Promising Practices, and distributed to teachers of participating schools. Teachers were later asked to respond by postcard to the Catalogue in terms of the suggested practices they planned to use. The generally poor response to the Catalogue of Promising Practices resulted in the implementation of a second approach, the Sharing Institute.

A one-day Sharing Institute was developed which consisted of: (1) having the participating teachers and administrators meet to listen to and discuss lectures by professionals on the necessity for developing and communicating innovative teaching techniques; (2) forming small groups (8-10 persons) to outline forces supporting and inhibiting innovative sharing, followed by discussion of these by the conference as a whole; (3) having the teams reconvene and propose teaching inventions that would make a contribution to their colleagues; (4) distributing these proposals to participants, who then completed assessment forms evaluating the

Sharing Institute experience as a method of educational interchange and improvement.

Findings and Conclusions

1. Postcard responses to the first identification and evaluation procedure (i.e., distribution of the Promising Practices Catalogue) proved to be less favorable than responses to the Sharing Institute experience.

(a) 12 percent of the respondents to the catalogue reported that they did not understand the book or found nothing new in it.
(b) 25 percent of those responding reported they would try one of the practices outlined in the book.
(c) 63 percent did not return the evaluation postcard.
(d) Of the 25 percent responding to the evaluation postcard, only 20 percent had used any of the suggested practices; reasons given for not using these suggestions included: a lack of time, ambiguity of the catalogue contents, inapplicability of the suggestions, etc.

2. Response to and participation in the Sharing Institute experience were highly favorable. The Sharing Institute was devised to: (a) help teachers recognize the need to share professional practices, and to cope with and understand restraints against sharing, (b) provide an opportunity for interpersonal exchange of their teaching inventions, and (c) provide a model for further sharing experiences.

(a) 83 percent of the participants rated the experience as helpful or very helpful.
(b) Over 90 percent of the participants indicated a desire to attend similar meetings in the future.

3. Some of the findings from the Sharing Institute.

(a) There exist barriers to sharing and adoption of educational innovations.
  (1) Within the school: lack of scheduled time to discuss new ideas; lack of administrative cooperation and unsatisfactory relations among school staff; different levels of maturity among children.
  (2) Within the school system: lack of communication between schools; lack of professional consultants; lack of opportunity to observe other school systems.
  (3) Within the teacher: lack of self-confidence; fear of criticism; fear of asking for or giving advice; difference with colleagues over educational philosophy and goals.
(b) There exist conditions which encourage sharing.
  (1) Within the school: good communication between teacher and pupil; scheduled time for idea sharing; supportive attitude of principal; reduced class size; good communication between experienced and newer teachers; the existence of a liaison person who would communicate or disseminate good practices.
  (2) Within the school system: up-to-date professional library; system-wide grade level meetings; administrative and school board support of sharing.
  (3) Within the teacher: positive attitude toward change; ability to adjust or adapt to change; self-confidence; desire for professional growth and recognition as an innovator; concern for the educational growth of children.

169

RESEARCH UTILIZATION
Adoption measures
Diffusion: education

ANALYSIS

Lippitt, R., and Havelock, R. Needed research on research utilization. In *Research implications for educational diffusion.* East Lansing, Mich.: Department of Education, Michigan State University, 1968.

Purpose

This is one of a group of papers presented at the National Conference on the Diffusion of Educational Ideas, held March 26-27, 1968, at Michigan State University. The overall purpose of the conference was to explore what happens within and around the local educational agency which brings about the adoption of innovations in education. The specific paper being summarized has as its stated purpose outlining the research utilization problem in education and identifying needed types of inquiry that should be attempted on research utilization.

Method

The context of the paper is drawn from the extensive experience of both authors. Dr. Lippitt discusses "The Process of Internal Linkage in Research Utilization" and Dr. Havelock, in the second half of the presentation, deals with "The External Process: Roles, Organizations, and Systems for Knowledge Linking." Since the Havelock segment is devoted primarily to what yet needs to be done, it is less relevant for the purposes of this study; accordingly, only the Lippitt segment is herewith summarized.

Findings and Conclusions

1. Three patterns are identified in the connections between resources for new knowledge and potential users:

(a) The potential adopter initiates the connection, looking for needed resources because he recognizes a need for improvement. The sense of having a problem is not necessarily enough to assure that his search will be successful. He needs to feel that the search for help is legitimized—that is, that the seeker will not be inhibited by fear of being judged. He needs to know how to ask the right question. It is important that the new knowledge be organized (perhaps by a consultant) in a way which will be applicable.

(b) A change agent initiates effort to communicate resources of knowledge that he believes are relevant to the target person. To be effective, this must be done in a climate of trust, with ample support to the potential user who, ideally, should not be made to feel that he is "playing for keeps" when first undertaking change.

(c) A third party, acting as the referral or linking agent, initiates and supports efforts to get relevant knowledge resources linked to potential consumers. This is often effected by a "temporary system" of an inside-outside team. A critical question here: How can the insider serve as innovation carrier to the system without losing his membership and status in that system?

2. Once the potential user is aware of the innovation and has decided to adopt it, his success in implementing the change can be enhanced if he engages in anticipatory rehearsal, role playing the situation of the first effort at utilization.

3. The adopting unit most needs outside support at the point of greatest risk taking. What is still not known is what types of support for adoption effort are needed for what types of innovation in what types of social contexts.

4. The potential adopter should understand that resistance within himself is natural and acceptable as he considers any new potential materials or behavior patterns. Sometimes the resistance has a realistic basis: The adopter is legitimately asking: "How does that fit into my situation?" Sometimes the resistance (within the individual as well as among members of a group) can be dispelled or clarified through human relations sensitivity training.

5. The author suggests that there is just as much danger in slavishly following the fad of change as in chronically resisting change.

6. In many cases, innovation is unsuccessful in the adopter's first attempt and hence is dropped.

This initial failure may be caused by lack of proper preparation for the new practice; it may be "motivated" failure (that is, an expression of resistance); it may be caused by lack of outside support during period of risk-taking as well as lack of feedback which might lead to revision of innovation. The initial go-around of the new practice should be given the greatest possible sense of success—even if it is only success on a small scale—to insure its continuity.

170

PLANNED CHANGE
Change strategies
Utilization factors
Change agent

ANALYTICAL MODEL

Lippitt, R., Watson, J., and Westley, B. *The dynamics of planned change.* New York: Harcourt, Brace, 1958.

Purpose

The purposes of the study are: (1) to compare method and operating principles of a number of professional change agents, (2) to seek a conceptual framework for helping techniques, (3) to survey research related to theories of planned change and to determine research priorities, (4) to relate findings to the training of graduate students in disciplines applicable to the change agent.

Method

The study is developed on the basis of review of the literature plus the extensive experience of the authors. The emphasis is on the professional change agent vis-a-vis four types of client systems: the individual, the small group, the large organization, and the community. The authors concentrate primarily on problems of planned change that occur in psychological processes, social relations, interpersonal processes, problem-solving procedures, and processes of social alignment or structure.

Findings and Conclusions

1. The following *problems of internal relationship within client systems* are identified:

(a) *Faulty internal distribution of power* (too highly concentrated, too diffuse, exerted in harmful or ineffective ways)—correctively, the change agent tries to develop new centers of power or make old ones more representative of the client system as a whole.

(b) *Faulty internal mobilization of energy* (the neurotic individual, the fragmented community)—the change agent emphasizes the contrast between productive use of energy in rational attempts to solve problems realistically and the nonproductive waste of energy in frustration and internecine conflicts. He may, in some situations, be concerned with improving the economy of energy use in already relatively healthy systems by relating the subparts of a system more effectively to the whole.

(c) *Breakdown in communication* (blocked situations in therapy, organizations suffering from lack of feedback)—some change agents try to correct defective patterns of communication within a client system and others use communication as a means of exerting pressure on the client system to change. In the latter case, the concern is not so much with removing pathological barriers as with stimulating an increased flow of information.

2. The following *problems of external relationships of client systems* are identified:

(a) *Discrepancy between the environment as it actually exists and as it is perceived by members of the system* (autism, inappropriate frame of reference, etc.)—a client system is helped toward a new experience of reality by means of the creation of a special reality which will simplify and emphasize the cues needed for objective perception (by means of a therapeutic environment, for example, or a laboratory environment).

(b) *Need to bring about changes in the goals and values which guide the client system*—the change agent sometimes simply asks the client to try new behavior in the hopes that changes in values and attitudes will follow. In other cases, the client's situation changes so that it is either forced into new behavior or led into it naturally.

(c) *Inadequacy of relational and problem-solving skills*—a client system can be helped to improve its external relationships by developing skills which can be used in problem solving or in improving human relations. In fulfilling this function, the change agent acts as resource and catalyst. He does not allow a dependency relationship to spring up between himself and the client system, and he does not attempt to impose his own goals for change.

3. During the change process, *the client system is exposed (sometimes simultaneously, sometimes alternately) to change forces and to resistance forces.*

(a) Some change forces manifest themselves at the beginning of the change project; these include dissatisfaction and pain, perceived discrepancy between the state of affairs as it is and as it might be, and the need for change in order to keep up with varying sets of requirements (competitive pressures in industry, for example).

(b) Some change forces more characteristically emerge during the change process; these include the need to complete a task which has been begun, the need to meet the expectations and demands of the change agent, and the need for change to penetrate an entire system after one part of the system is significantly changed.

(c) Resistance forces evident early in a change project include general opposition to change, inability to change, opposition to a specific change objective, and desire to preserve existing satisfactions.

(d) Once a project is underway, resistance may arise from a reevaluation of costs, reassessment of difficulties encountered in the project, loss of energy and motivation, and problems in relationship with change agent.

(e) The interdependence among the subparts of a system and between the system and its environment can generate both change forces and resistance forces.

(f) Change can be impeded by outside interference rather than by internal resistance. Other projects might compete with the change project for the time, energy, and money of the client system; there might be incorrect or inadequate information about how to carry out the change project; or the environment may simply be intractable.

4. *The role of the change agent* includes the following activities:

(a) diagnosing the nature of the problem in the client system;
(b) assessing the client system's motivations and capacities to change;
(c) appraising the agent's own motivations and resources;
(d) selecting appropriate change objectives;
(e) choosing an appropriate type of helping role;
(f) establishing and maintaining the helping relationship;
(g) recognizing and guiding the phases of the change process;
(h) choosing the specific techniques and modes behavior which will be appropriate to each progressive encounter in the change relationship; and
(i) contributing to the development of the basic skills and theories of the profession.

5. *Seven phases in the process of planned change* are identified and generalizations are made for each phase.

(a) *The development of a need for change*—this includes an awareness of the problem, a recognition that the condition might be improved as the result of change, and a willingness to seek outside help in bringing about the change.

(b) *The establishment of a change relationship*—this involves developing rapport with the change agent, making certain that the change agent understands what needs to be done and that the client system understands what sort of collaboration it must provide. In an organization, procedural questions must be settled (Who pays? How much? Who will serve as liaison?). Sometimes this phase serves as a trial period, during which the decision to work together is readily reversible.

(c) *The clarification or diagnosis of the client system's problem*—original perceptions concerning the problem are sharpened, relevant data are collected, the problem is redefined, and the client takes a new look at it.

(d) *The examination of alternative routes and goals; establishing goals and intentions of action*—this is the stage in which the client system translates its diagnostic insights first into alternative means of action and then into definite intentions to change in specific ways. In this process, both cognitive and motivational problems are likely to arise.

(e) *Transformation of intentions into actual change efforts*—this is the phase during which strong support from the change agent is needed. It is important, too, to get feedback from various subparts of the system and to make certain they are supporting the change.

(f) *The generalization and stabilization of change*—too often change which has been produced by painstaking and costly efforts tends to disappear after the change effort ceases, and the system, though it wanted the change, slips back into its old ways. Positive evaluation and rewards help stabilize change. Spread of change to other systems endows it with status and thus helps stabilize it. Procedural change tends to be stabilized if it is supported by structural change.

(g) *Achieving a terminal relationship*—ideally, the relationship with the change agent is terminated with the client system having learned problem-solving techniques which will carry over into new and different problems. Sometimes it is sound to train someone within the system who, to a certain extent, will serve as an ongoing replacement for the change agent.

6. Certain *specific "helping methods"* applicable to each of the above phases are cited.

(a) *The development of need for change:*

(1) If the change agent initiates the change sequence, he: (a) must make known his availability and readiness to help (publicity, brochures, organizational links); (b) heighten or spread sensitivity to specific problems (shock technique, using system's most sensitive persons, establishing himself within group as observer, conducting problem census); (c) offer help in solving acknowledged problems (sometimes exploiting existing power conflict); (d) create special social atmosphere in which the accepted standard is to recognize the existence of problems and the need for help (as in training laboratories).

(2) If a third party initiates the change sequence: (a) the change agent must clarify to the client the relationship of the consultant to the third party (dispel suspicion of collusion for example); (b) the change agent should use the third party as a source of help.

(3) If the client system initiates the change sequence, the change agent must help the client identify the need for change and the readiness for it.

(b) In the process of *establishing a change relationship,* the change agent should:

(1) Assess the client's capacity to accept and use help.

(2) Assess the client's motivation to accept and use help (for example, is it primarily a striving for power?).

(3) Assess his own (the change agent's) resources and motivation (Is his training applicable? Are the techniques which have worked elsewhere transferrable to this situation?).

(4) Obtain a mutuality of expectation for the change relationship (How much will it take? How many people will be involved?).

(5) Clarify expectations about the kind and amount of work which will be required.

(6) Anticipate difficulties which will emerge in the change relationship.

(7) Define the influence relationship (considerations of coerciveness and dependency).

(8) Clarify special goals of the change agent (which may not always be manifest to client).

(c) In the *diagnostic phase,* the change agent must:

(1) Obtain information (by direct questioning, by seeking it from neighboring systems, by demonstration of problem, by participant observation, by projective communication).

(2) Process information (by assuming generality of problem, by acting independently, by acting cooperatively with client, by encouraging client self-analysis).

(3) Stimulate understanding and acceptance of diagnostic insights.

(4) Impart diagnostic skills.

(d) In *establishing goals and intentions of*

action, the change agent should:
(1) Define the direction of change.
(2) Arouse and support intentions to change.
(3) Provide opportunities for anticipatory testing.
(4) Develop and mobilize competence in action.

(e) In *initiating the change effort,* the change agent's techniques may include:
(1) Giving direct support to the client system during the initiation of change (consultation, demonstration, observation, etc.).
(2) Developing support within the larger client system for change efforts by a subpart.

(f) Techniques for the *stabilization of change* include:
(1) Providing credible evaluation of effects of change.
(2) Exploiting the momentum of the change effort as a stabilizing factor.
(3) Exploiting the pride of status as a stabilizing factor.
(4) Encouraging the spread of change through demonstration.
(5) Offsetting the forces of resistance (which sometimes show up belatedly).
(6) Cultivating (in the client) the perception of change as a continuing institution.

(g) To prepare the client for optimal termination of the change agent's role, the latter should:
(1) Train the client in problem-solving methodology.
(2) Arrange for some of his functions to be permanently incorporated in the client system.
(3) Arrange for periodic checkups to prevent recurrence of original problem.
(4) Train the client concerning when and how to seek further help.

7. The authors stress the need for a unified theory of change and changeability and for the establishment of priorities for research and experiment (for example, the effectiveness of different change agent techniques needs more precise evaluation).

8. Finally, the requirements for the training of change agents are delineated. Among the valid areas of specialization are: by type of client system; by diagnostic orientations and methods; by areas of change objects; by level of problem; by type of change method.

171

INNOVATION: EDUCATION
Diffusion characteristics
Practitioner characteristics

EXPERIMENTAL STUDY

Lippitt, Ronald, et al. The teacher as innovator, seeker, and sharer of new practices. In R. E. Miller (Ed.), *Perspectives on educational change.* New York: Appleton-Century-Crofts, 1967, pp. 307-324.

Purpose

Teachers' general reluctance to change is discussed in terms of the forces that facilitate and those that hinder innovation and diffusion in the field of education; the preliminary findings of a field experiment dealing with the innovation-diffusion process among teachers are discussed.

Method

The analysis of facilitating and hindering forces in educational change was generated from a series of meetings with school personnel.

The field experiment consisted of a project sponsored jointly by the Center for Research on the Utilization of Scientific Knowledge (CRUSK) and the Department of Classroom Teachers of the Michigan Educational Association, which was designed to encourage more communication and support among teachers and other educational professionals during innovation and diffusion of new teaching practices.

Area teams, composed of teachers (selected as opinion leaders), counselors, principals, librarians,

superintendents, curriculum coordinators, and assistant superintendents, were developed for each of four participating school districts. The teams were designed to function as a liaison group between the CRUSK staff, the Department of Classroom Teachers, and teachers in the school systems, and were given responsibility for developing and implementing the plans for stimulating innovation and diffusion.

Findings and Conclusions

1. Innovation and change in education often involves changing the attitudes, values, and behavior patterns of teachers and administrators. Therefore, it demands more commitment, risk taking, and help from outsiders than innovation and change in fields where innovation involves nothing more than the introduction of new physical products.

2. The forces that facilitate and hinder innovation and diffusion in the teaching field can be related to: (a) characteristics of the practice, (b) physical and temporal arrangements, (c) peer and authority relations, and (d) personal attitudes. A list of these forces follows.

FORCES RELEVANT TO THE FACILITATION AND HINDRANCE OF INNOVATION AND DIFFUSION OF TEACHING PRACTICES

Facilitating forces	*Hindering forces*
1. Characteristics of the Practice	
A. Revelant to universal student problems.	A. Does not meet the needs of a class.
B. Can be done a little at a time.	B. Requires a lot of energy.
C. Consultant and peer help available, needed skills are clearly outlined.	C. Requires new skills.
D. Clearly aids student growth.	D. Requires change in teacher values.
E. A behavioral change with no new gimmicks.	E. Requires new facilities.
F. Built in evaluation to see progress.	F. Won't work.
G. Innovation has tried a new twist.	G. Not new.
H. Student, not subject, oriented.	H. Not for my grade level or subject.
I. No social practice can be supplicated exactly.	I. Effectiveness reduced if practice gains general use.
2. Physical and Temporal Arrangements	
A. Staff meetings used for professional growth, substitutes hired to free teacher(s) to visit other classrooms, lunchtime used for discussions, students sent home for an afternoon so teachers can all meet together.	A. No time to get together.
B. Extra clerical help provided.	B. Too many clerical duties to have time to share ideas.
C. Staff meetings for everyone to get together, occasionally; grade level or departmental meetings.	C. Classrooms are isolated.
D. Meetings held in classrooms.	D. No rooms to meet in.
3. Peer and Authority Relations	
A. Sharing sessions or staff bulletins become a matter of school routine.	A. Little communication among teachers.
B. Public recognition given to innovators and adopters; innovation diffusion seen as a cooperative task.	B. Competition for prestige among teachers.
C. Sharing ideas is expected and rewarded; norms support asking for and giving help; regular talent search for new ideas.	C. Norms enforce privatism.
D. Area team liaison supports new ideas.	D. Colleagues reject ideas.
E. Principal or superintendent supports innovation-diffusion activity.	E. Principal is not interested in new ideas.
F. Principal helps create a staff atmosphere of sharing and experimentation.	F. School climate doesn't support experimentation.
G. Staff meetings used as two-way informing and educating sessions.	G. Principal doesn't know what's going on.
H. Teachers influence the sharing process.	H. Teacher ideas don't matter.

4. Personal Attitudes

A. Seeking new ways.	A. Resisting change.
B. Seeking peer and consultant help.	B. Fearing evaluation and rejecting failure.
C. Always open to adapting and modifying practices.	C. Dogmatism about already knowing about new practices.
D. Public rewards for professional growth.	D. Feeling professional growth not important.
E. See groups as endemic and relevant for academic learning.	E. Negative feelings about group work.
F. Understand connection between mental health and academic learning.	F. Mental health is "extra."
G. Optimism.	G. Pessimism.
H. Test ideas slowly.	H. Afraid to experiment.
I. Suiting and changing practice to fit one's own style and class.	I. Resistance to imitating others.

3. There are two basic processes for linking teachers to new resources and supporting their innovative efforts:

(a) *Vertical linking*—vertical linkings are bridges between the teacher and higher status individuals who can provide information and needed resources. The most common vertical linkage is between teachers and administrators and/or supervisors. A vertical linkage that might be utilized more effectively is between the teacher and research consultant.

(b) *Horizontal linking*—horizontal linkages are the connections between teachers who are interested in sharing or adopting relevant teaching innovations.

4. Certain factors related to teachers and their perceptions affect innovation and diffusion.

(a) The innovative practice must be seen as relevant, helpful, and appropriate to the teacher's classroom goals and personal style of classroom management.

(b) Teachers who believe they are influential and are perceived as influential by their colleagues innovate and share more than teachers who are not perceived in this way.

(c) Teachers who perceived colleague support in adoption efforts were more likely themselves to be adopters of new practices.

(d) Teachers who perceive a principal as supporting innovation do, in fact, innovate more often.

(e) Teachers who are self-confident are more willing to share their classroom activities and information about these activities with their peers with a minimum of fear and rejection.

(f) Teachers who are highly committed to the profession appear more willing to engage in discussions about their profession and professional activities than teachers who are not so highly committed.

(g) Teachers who are generally open and ready to share also seem to be more willing to talk about professional educational experiments than other teachers.

(h) The younger and older teachers appear to be more innovative and adoption oriented than the middle range of teachers; older teachers tend to be potential adopters more than do younger teachers, but younger teachers seem more innovative.

5. The social (communication) structure of the school seems to have a different effect on adoption than on innovation.

(a) In schools with a diffuse social structure where almost every teacher was linked to someone, teachers innovated and shared more than in schools with a hierarchical or nondiffused communication structure.

(b) In those schools where the structure was more hierarchical, teachers adopted more often than in schools with a diffuse structure.

(The differences in the innovation adoption findings are explained in the following manner: "Since innovation involves novelty and risk, it is reasonable that schools with open communication and support systems encourage innovation. . . . Adoption efforts, however, do not appear to involve the same personal risks as innovation, since it is more a matter of following or modifying another's efforts.")

6. Teachers involved in small groups of two or three were more innovative than those who were isolated or involved in large groups, while teachers who saw themselves in positions peripheral to either large or small groups were more apt to adopt than those centrally involved.

7. In schools where the principal is sensitive and

accurate about the nuances of peer relationships among teachers, more sharing is done and diffusion occurs.

8. The greater the frequency with which the principal was seen engaged in such activities as offering constructive suggestions to teachers, bringing education literature to their attention, talking to them about their personal and professional activities and growth, or showing that he knows what was going on in classrooms, the greater appears to be his influence on the degree of innovation and adoption. More than one-third of the teachers who viewed the principal as bringing educational literature to their attention adopted new practices, while those who viewed him as never bringing such literature to their attention did not adopt new classroom practices.

172

INNOVATION: INDUSTRIAL
Innovation factors
Change measures

EMPIRICAL STUDY

Little, Arthur D., Inc. *Patterns and problems of technical innovation in American industry.* Report to National Science Foundation, No. C-65344. Washington, D.C.: National Science Foundation, 1963.

Purpose

This report explores the dominant patterns of innovation in mature* industries and the internal problems of technical innovation in such industries as a basis for proposing a series of suggestions for directed change in these industries.

Method

Five industries (textiles, machine tools, construction, appliances, and semiconductors) were historically analyzed to determine answers to questions such as: Where has significant innovation come from? How has it come about? What has been the timespan for adoption? What have been the problems about innovation and the obstacles to it? How do relationships among such areas as research and development, management, marketing, and production affect the innovation process?

The analytical procedures involved investigation of economic and product trends within each of the industries, analysis of published profit and technical reports of companies involved in all aspects of these industries, and some interviews. Several companies within each of the five industry areas provided the data for the study. The innovations studies were all of a technical nature and the basis for innovation was profit.

*Maturity is defined as those characteristics of tradition and stability which indicate that an industry has exhibited the tendency to level off in growth, rising only when the gross national product does.

Findings and Conclusions

1. The companies studied revealed little growth or innovation and few technical innovations of major technical and economic significance.

2. Technical change from within is limited to slow, evolutionary improvement in products and processes.

3. Innovations occur in clusters. A major innovation requires change for its implementation which fosters further innovation.

4. Major innovations have come primarily from outside the traditional or mature industries. They have come from: foreign technology, independent inventors, new small firms, and invasion of the traditional industries by technically advanced and established firms in other industries.

5. Innovation by invasion is the major source of technical change in mature industries. (Invasion occurs in three ways: The old borrows what it wants from the new, the new introduces change into the old, or the new displaces the old.)

6. The slow rate of innovation and change in mature industries is related to the fact that traditional industries are:

(a) Built on craft-based rather than science-based technology.
(b) Fragmented, in the sense of: (1) encompassing a large number of companies too small to economically promote innovation; and (2) di-

viding the work of the industry into many small steps, each under the control of separate organizations.

(c) Focused on production and committed to present methods.

(d) Protected by powerful social systems (family, company, local community, etc.) which would be threatened by large-scale change and innovation.

(e) Notably lacking in entrepreneurship and entrepreneurial models.

7. Based on their analysis, the Arthur D. Little Co. offered the following suggestions for encouraging change in mature industries:

(a) If the goal is to encourage innovation in mature and traditional industries, supplying technical information will not be enough. Entrepreneurial problems that stand in the way of innovation must be resolved. Two possible avenues for overcoming entrepreneurial problems in traditional industries are: (1) encouraging the formation of new businesses within the industry, and (2) industry-wide consulting. A consulting firm could be developed within an industry by assembling, from the various companies, groups of individuals to work over long periods of time on shared problems of innovation; or the industries might develop a service much like the agricultural extension service.

(b) If the goal of change is the facilitation of invasion of the mature industries by other industries, industrial mobility can be promoted. Industrial mobility would reduce the cost of invasion to workers, companies, and industry locales. It more nearly is in the interest of rapid change than working on the entrepreneurial problems of traditional industries.

(c) There is a need for new forms of government-industry collaboration in which government acts neither as a monitor nor a crutch, but as a partner in technical change. Government can represent interests broader than those of an individual company, industry, group of workers, or area of the country.

173

KNOWLEDGE UTILIZATION
Change agent

ANALYSIS

Lundberg, Craig C. Middlemen in science utilization: Some notes toward clarifying conversion roles. *American Behavioral Scientist,* February 1966, 9, 11-14.

Purpose

In converting scientific knowledge into practice several aspects need to be considered. In this article the author attempts to define and clarify different conversion roles.

Method

The author has drawn from his own knowledge and experience in developing this conceptualization.

Findings and Conclusions

1. Conversion roles may be placed along a continuum. At one end is science, which according to Lundberg is a combination of three factors: (a) a body of knowledge meeting "certain specific requirements"; (b) a method which meets "certain specific requirements in data gathering"; and (c) a group of values or norms prescribing "certain specific requirements" which the activities of persons must meet in order to be scientific. Nonscience (which includes the realms of practice or practical action) is at the other end of the continuum.

2. In distinguishing between scientist and practitioner, Lundberg describes the former as one who adheres to the notions stated above concerning science. The term practitioner refers to one who practices with an objective other than the accumulation of certified knowledge using empirical meth-

ods under certain value conditions.

3. The author characterizes and places several conversion roles on the science-practice continuum:

(a) The *technician* occupies a place on the continuum very close to a purely nonscientific role or practice end of the continuum. His competence is restricted and he may be only slightly familiar with the fund of basic knowledge underlying his specialization. An example of such an individual is the opinion pollster.

(b) The *professional* occupies the middle portion of the continuum and is basically a practitioner. "They attempt to utilize the knowledge and/or methods of science in the achievement of their service objectives." Their methods are, however, not always wholly scientific and their goals are almost always other than the accumulation of knowledge.

(c) The *applied scientist* occupies a place toward the scientific end of the continuum. He is "concerned with the prediction and production of social and cultural change." He uses the scientific method but his objectives differ from the pure scientist in that they usually center around change with regard to a specific problem rather than around knowledge accumulation.

174

RESEARCH UTILIZATION
Adoption deterrents
Research-practitioner relationships
Change agent

ANALYSIS AND SUGGESTIONS

Mackie, Robert R. Chuckholes in the bumpy road from research to application. Paper presented at the meeting of the American Psychological Association, New Orleans, August 1974.

Purpose

Within the framework of a model of the research-to-application process, the paper is devoted to the analysis of factors that might account for the low applicational potential of human learning research.

Method

A sample of research studies sponsored by the Navy was reviewed as a basis for a speculative analysis of: (a) their applicational potential; and (b) the factors that differentiate low from high applicational potential.

Findings and Conclusions

1. The reasons that the great majority of learning research studies "were found to have had virtually no impact on instructional practice in the Navy or elsewhere" center on seriously neglected activities in the research-to-application process and to a number of characteristics of the research studies themselves.

2. A model of the research-to-application process was devised to interrelate the following elements: (a) general theory construction; (b) specific basic research; (c) collation and interpretation (of research); (d) translation; (e) applied research; (f) developmental technology; and (g) application.

3. Of these elements, (a) collation and interpretation; and (b) translation are considered to be the two seriously neglected and underdeveloped activities that are responsible for the isolation of basic research from application.

4. Many research studies seemed not only to defy application, but also translation as well, since the results of psychological research on learning, as well as in other behavioral areas, appears to be "distressingly specific to the task conditions, independent and procedural variables, and dependent measures selected for use by the investigator."

5. Psychologists have contributed more to change in operational systems on the basis of the methods by which they study human behavior than they have in the form of directly useful facts about human behavior.

6. When studies are sorted according to low versus high potential application, the applicational

potential is related to the following considerations:

(a) The basic motivation of the experimenter.
(b) The experimenter's selection of tasks in terms of his theoretical position and/or how conveniently they can be generated by the types of available equipment.
(c) The stimulus and response characteristics of the tasks employed.
(d) The limitation in the response repertoire permitted.
(e) The motivation of the participating subjects.
(f) Time compression.
(g) Difference in the experimental environment.

7. To achieve high probability of application, research design must be devised with application in mind, and experimental control will need to be less rigid. Communication between researcher and practitioner *in both directions* is required. A specially trained middleman can play an important role in elevating applicational potential.

175

RESEARCH UTILIZATION: PSYCHOLOGY

Knowledge dissemination
Research-practitioner relationships

EMPIRICAL STUDY

Mackie, R. R., and Christensen, P. R. *Translation and application of psychological research.* Technical report 716-1. Goleta, Calif.: Santa Barbara Research Park, Human Factors Research, Inc., 1967.

Purpose

The objectives of this study were: (1) to study communication processes between researcher and user; (2) to study characteristics of research studies and practices of researchers affecting application; and (3) to describe attitudes and practices of users that affect application.

Method

The procedures were: (1) analysis of selected studies of human learning to define their possible practical applications for the Navy; (2) analysis of the impact of research findings on Navy training and the channels of the research findings; (3) formulation of useful principles of learning to examine the problem of translating principles into application; (4) a study of information required by research translators in assessing the usefulness of principles derived from research for any specific purpose; and, (5) using the hypotheses developed in procedures (1) to (4), an examination of judgments and attitudes of psychologists renowned in learning and educational psychology with positions of responsibility for focusing research on issues vital to application of research results.

Findings and Conclusions

1. There is a limited impact of learning research on practical problems. Laboratory studies were often too narrow, too specific, too short in duration, reported in too much jargon.

2. Barriers to research utilization are:

(a) There is a need for learning engineers, a corps of professionals who can assess the meaning of research findings for innovation and application. The learning engineer will require specialized knowledge of the subject matter in training and research but he must remain a generalist rather than a specialist.
(b) There is a backward gap that now exists in communication channels; that is, from the training environment back to the research community. The proportion of research psychologists willing to get their hands dirty in this way is small.
(c) Users are generally incapable of formulating their problems in research terms.
(d) All of this will require some change in university departments that are not presently equipped to train people who are needed to fill this engineering change agent role.

3. The recommendations from this study, while

generally applicable, are specifically directed toward mission-oriented agencies. The recommendations are:

(a) Agents sponsoring psychological research should require that the relevance of the proposed research to meaningful operational problems be established. The research proposal should be explicit on relevance and the scientist should take field trips to the operational site; particularly, research program directors should make periodic surveys to keep abreast of the specific operational problems.

(b) Researchers should be encouraged to employ conditions in their experiments that are similar, if not identical, to those encountered in the practical setting.

(c) Researchers should be encouraged to test hypotheses in the training or operational environment.

(d) In the event that the research is not done in the practical setting, research findings should be validated in the appropriate setting.

(e) In the interest of improving interpretation and dissemination of research, conferences should be held with psychologists and other research agents, and with agencies with personnel responsible for psychological abstracts and information storage and retrieval, to determine congruity and interest in requirements.

(f) In the interest of increasing the probability of research applications, sponsoring agencies (in this case, the Office of Naval Research) should arrange for consultation between the original investigator and those doing the validation study.

(g) Sponsoring agencies (in this case, the Office of Naval Research), should sponsor periodic symposia in a continuing effort for the development of more meaningful behavioral descriptions and to develop more meaningful task research.

(h) In the interest of facilitating communication and increasing user acceptance, particularly on learning, the Office of Naval Research should sponsor a symposium with emphasis on the current utility of learning principles for educational technology. It should involve users as well as researchers.

(i) Simulation of a training curriculum for the learning engineer, a role previously discussed, is needed.

(j) In the interest of facilitating communication among researchers as well as practitioners, there should be required writing of research abstracts in a standardized format. The required format would include the enumeration of all major features of the study, subject's task, dependent and independent variables, time factors, etc.

176

KNOWLEDGE DISSEMINATION
Research utilization: education
Communication media

EMPIRICAL STUDY

Magisos, J. H. *Interpretation of target audience needs in the design of information dissemination systems for vocational-technical education.* Columbus: The Center for Vocational and Technical Education, The Ohio State University, 1971.

Purpose

This study was carried out at the Center for Vocational and Technical Education at Ohio State University, under sponsorship of the National Center for Educational Research and Development. It was designed to obtain information about people who use vocational-technical information. The data gathered was intended to guide design of state information dissemination systems in the vocational-technical education area.

Magisos describes the organizational position, subject matter field affiliations, and personal education activities of people in several job classifications. The study also was concerned with whether the respondents were aware of various information

sources, particularly ERIC (Educational Resource Information Center), whether they used these sources, if they found them useful, and what additional services were perceived as needed.

Method

A questionnaire survey was completed by 3,229 vocational-technical educators in seven states, based on a stratified random sample of seven target audience categories. The study was primarily designed to describe the target audiences and to determine audiences' patterns of information use.

Findings and Conclusions

Analysis of questionnaire responses led to thirteen conclusions:

1. Vocational-technical educators need better information products and services: the period preceding school terms is a time of particular need.
2. Vocational-technical educators spend much time gathering information to help them in their work.
3. Many vocational-technical educators are unfamiliar with ERIC. Few have been taught how to use it properly; most would like to learn.
4. ERIC information is better designed to meet user needs than information from other sources, but other sources are still used more than ERIC.
5. Different categories of educators find different forms of information useful.
6. Relevance to perceived problems, speed in obtaining information, currentness, and brevity are important characteristics of information.
7. Regularly distributed abstract journals are the most frequently used ERIC products.
8. The ERIC Clearinghouses and Regional Coordinating Units have been distributing ERIC products widely, but many vocational-technical educators have never received, requested, or used ERIC materials.
9. Vocational-technical educators prefer direct, personal contact with familiar and convenient sources of information, but many are also willing to travel to get the information they need.
10. Some other information services (not specified in the document) are more useful to vocational-technical educators than ERIC services.
11. Educators get faster service than they expect from most information sources, but service is still slower than is ideally desirable.
12. There are few important differences between users in different states.
13. Vocational technical educators who themselves are enrolled in courses (e.g., at night school) do not differ in their information use patterns from those who are not enrolled. This finding disconfirms the study's only hypothesis.

The author makes nine recommendations based on the study's findings:

1. A training unit should be developed to teach teachers how to use ERIC.
2. Local and school libraries should be given assistance in developing information resources and services.
3. Information products should be designed for the intended users.
4. Journals, magazines, newsletters, etc., should be considered viable means for disseminating information.
5. A brief, targeted version of a regularly distributed abstract journal should be tested for use by local school personnel.
6. State and local programs should develop a wide range of information services.
7. Information should be delivered to users faster than it is now.
8. Target audience studies should be conducted on a limited scale to verify the results of this study.
9. Future studies, using different methods, should focus upon users' problems and how information systems meet them.

177

GROUP DYNAMICS
Organizational change
Problem solving

EMPIRICAL STUDY

Maier, N. R. F., and Zerfoss, L. F. MRP: A technique for training large groups of supervisors and its potential use in social research. In M. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes and R. J. Lewicki (Eds.), *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

To describe Multiple Role Playing (MRP) and to point out its advantages over ordinary role-playing in teaching decision making to groups.

Method

An example of the MRP procedure is presented with an analysis of the results. The results from several other cases are briefly summarized, and then a general evaluation of the MRP is given.

Findings and Conclusions

1. The MRP method permits role-playing to be carried out in such a manner that all members of a large audience can participate. The purpose of the technique is to give each member of an audience a firsthand experience in the group decision method.

2. MRP permits the training of supervisors in skills of leading discussions and at the same time gives them an experience of the way things appear to employees. Supervisors will learn to develop confidence both in the way employees behave when given an opportunity to solve job problems and skill in putting a problem to the group.

3. The problem used in the session described is based on an actual case in industry. The foreman has a new truck to distribute. Realizing that his decision would not meet with approval since each man would feel he had a claim, he put the problem to the crew. They solved the problem in such a way that there was a general exchange of trucks, with each man getting a different truck, and with the poorest truck being discarded.

Each participant is given a personal attitude so that typical life-like conflicts will take place. The deviation from the usual role-playing procedure is that the same roles are played simultaneously by many groups, each without the guidance of a trainer. This absence of specific guidance makes standardization and the use of clear-cut problems essential.

The audience is divided into groups of six. One member is given the role of foreman, and the other five members of the group will be repairmen who report to him. Extra persons are assigned to discussion groups as observers.

Less than half an hour is adequate for most groups to solve the problem.

4. The results are analyzed as to how many groups arrived at a solution, how many were satisfied with the solution, how many discarded the poorest truck, the number of times the new truck went to each of the various members of the crew, and the number of trucks exchanged in each group.

Also, the persons serving as observers evaluate the discussion meetings they observed.

5. After using the MRP in three cases, a trend emerged in which the general exchange of trucks was greatest when the leader was permissive. The first part of the discussion develops a conflict of interests, and if the leader is permissive at this stage, the idea of exchanging trucks develops. Many men who played the part of supervisor were surprised at this development because most of them went into the discussion with the idea of getting the new truck assigned to some particular individual and getting the rest of the group to agree on who was most needy. It is this emphasis on the leader's part that prevents the general exchange which usually develops out of the free discussion. Thus, the idea that all can profit when the crew gets a new truck emerges as a new idea, and it is a group product.

6. The authors conclude:

(a) There is less embarrassment and self-consciousness in MRP than in ordinary role-playing since all members of the audience are involved.

(b) Real live data can be obtained because comparisons can be made between groups and generalizations drawn.

(c) The MRP method can be used for all types of role-playing. Roles must be structured to conform to the purpose of the training and experience of the participants, and the situation must be designed to emphasize the appropriate performances.

178

INNOVATION DIFFUSION
Organizational factors

CONFERENCE REPORT

Manela, Roger. Notes on innovation diffusion. Unpublished summary of conference, Manpower Laboratory, Institute of Labor and Industrial Relations, University of Michigan, February 1969.

Purpose

The purpose of the conference which generated these notes was to gain as much information about theoretical and practical aspects of innovation diffusion as the participants could offer. The focus of the discussion was specifically the nature and purpose of the manpower laboratory.

Method

As far as can be inferred from the notes, the conference was a relatively freewheeling discussion involving a group of social scientists (principally from the manpower lab) concerned with innovation. Since many of the points reported deal with problems and procedures of the lab, no attempt is made herewith to summarize the full content; rather, those points have been abstracted which have broad application.

Findings and Conclusions

1. The suitability of an innovation depends on the level (in the receiving agency) at which it is to be applied; an administrative innovation might be credible and acceptable to administrators yet arouse little response in or have little effect on lower organizational levels.

2. The type of agency to select as the testing ground for an innovation raises a number of considerations:

(a) Action-oriented agencies often are involved in innovations they are not even aware of; they are so caught up in doing things that they fail to analyze their actions.

(b) Action-oriented agencies often have a high rate of staff turnover; this complicates the problems of evaluating the effects of innovation.

(c) If you choose those agencies which have a reputation as risk takers, you insulate yourself from the experience of encountering and coping with the resistances which the innovation will trigger in the more conservative agencies.

(d) There is a tendency to place the innovation with an agency which is a pacesetter on the assumption that its success there will cause it to spread to related agencies. Yet selecting the pacesetters is no easy task. Are they the old agencies . . . the sacred cows? Or are they the agencies with a past history of success?

3. Some units of an agency will be more amenable to change than others. Those units whose power is based on a status quo situation or who feel that change will increase their workload will resist change. Out-groups or units whose goals are oriented toward output rather than internal power relations tend to be prochange.

4. The way one gains entry to a user agency and the point of entry are crucial to the direction of change. A common model for gaining entry is the demand model in which: (a) there is a crisis-catalyzed appeal to the change agent; (b) all elements of the organization need not call on the change agent as long as; (c) those who do call on it have the power to do so even in the face of opposition; and (d) the crisis which prompted the demand for help enhances the credibility of the innovation. Other modes of entry: by fortuitous contact with the agency; by coercive power; by rational analysis of suitability of innovation to agency.

5. With respect to evaluation, the following rele-

vant point was made: the range of variability between agencies makes it difficult to replicate any given test of the effectiveness of an innovation. Even within a single agency, operating conditions and operating personnel change so much over a period of time that scientifically valid comparisons are hard to come by. In short, one's aspirations concerning evaluation should be realistic rather than rigorous.

179

CHANGE MEASURES
Individual reeducation
Interpersonal relations

EMPIRICAL STUDY

Mann, F. Studying and creating change: A means to understanding social organization. In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gindes, & R. J. Lewicki (Eds.), *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

This article describes and compares two types of procedures designed to change interpersonal and intergroup relations as well as to increase utilization of research findings in complex organizations: (1) human relations "classroom" training programs designed to train or teach the individual supervisor how to work with employees by providing "courses" in human relations, (2) organizational feedback programs reporting the results of extensive surveys sampling employee and management attitudes and perceptions.

Method

Comparative analysis. The author outlines two studies which use the classroom training technique. An evaluation is made of the effectiveness of this technique in terms of changed supervisory attitudes and performance. These findings are compared with a second study in which the feedback method of organizational change and information utilization was used to increase supervisor and employee effectiveness.

Findings and Conclusions

1. The two studies using the classroom training method in human relations demonstrated that this type of training does not assure the translation of such learning into job performance.

2. The study in which an experimental group was exposed to feedback programs (in the form of meetings between management and employees to discuss the results of an extensive opinion survey) and a control group was not . . . demonstrated that the feedback system was a highly effective method for increasing understanding and communication between organizational employees as well as for changing supervisor behavior.

180

PLANNED CHANGE
Change model
Change factors
Change strategies
Change agent

CASE STUDY

Mann, F. C., and Neff, F. W. *Managing major change in organizations.* Ann Arbor, Mich.: Foundation for Research on Human Behavior, 1961.

Purpose

The seminars upon which the publication is based were conducted for the purpose of reviewing current (spring of 1959) knowledge about change in organizational settings and to draw attention to the need for research about planned or directed change.

Method

Four case studies were presented of major organizational changes. Line executives and researchers involved in the cases reported their experiences and findings. Members of the seminar then joined to identify factors which had helped or hindered the change effort, and attempted to isolate points upon which they felt some tentative generalizations might be built.

Findings and Conclusions

1. The idea of a new role—that of change catalyst—evolved from the discussions. The change catalyst might be expected to do whatever staff functions were required to help the change agent accomplish his assignment. The change catalyst would be expected to hold himself apart from the direct management of the ongoing change so that he might better see the larger issues and problems of the strategy being followed in the implementation of the change.

2. Great importance was attached to the need for the key executive to fully understand the implications of the change for his operations or those of other executives in the organization. Thorough discussion of all ramifications of the change ("the controlled explosion") was urged. Such discussion would have as its objective to bring out problems which would center attention, elicit greater involvement, and gradually bring greater understanding of changes the organization was embarked upon.

3. The change agent needs to understand and be able to use different types of power: legitimate power (based on obligation or duty); reward power (ability to give or withhold reward); coercive power (potential for punishment); expert power (based on greater knowledge or ability); referent power (based on attraction and/or identification).

4. The findings with regard to understanding an individual's response to change are presented schematically in Figure 3 of the report.

5. Strategies for managing change are summarized diagrammatically in Figure 4.

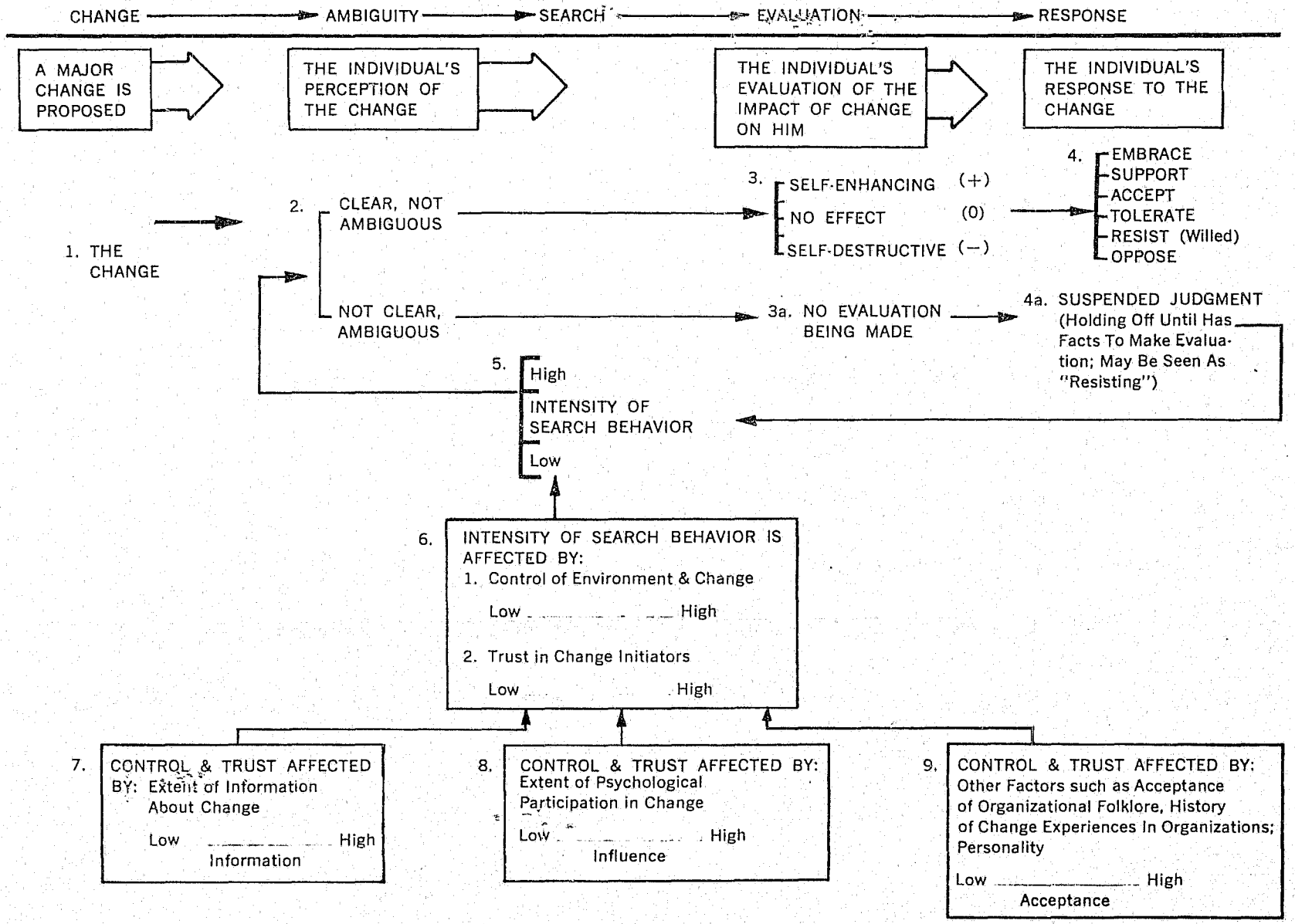


FIGURE 3
Model for Understanding an Individual's Response to Change

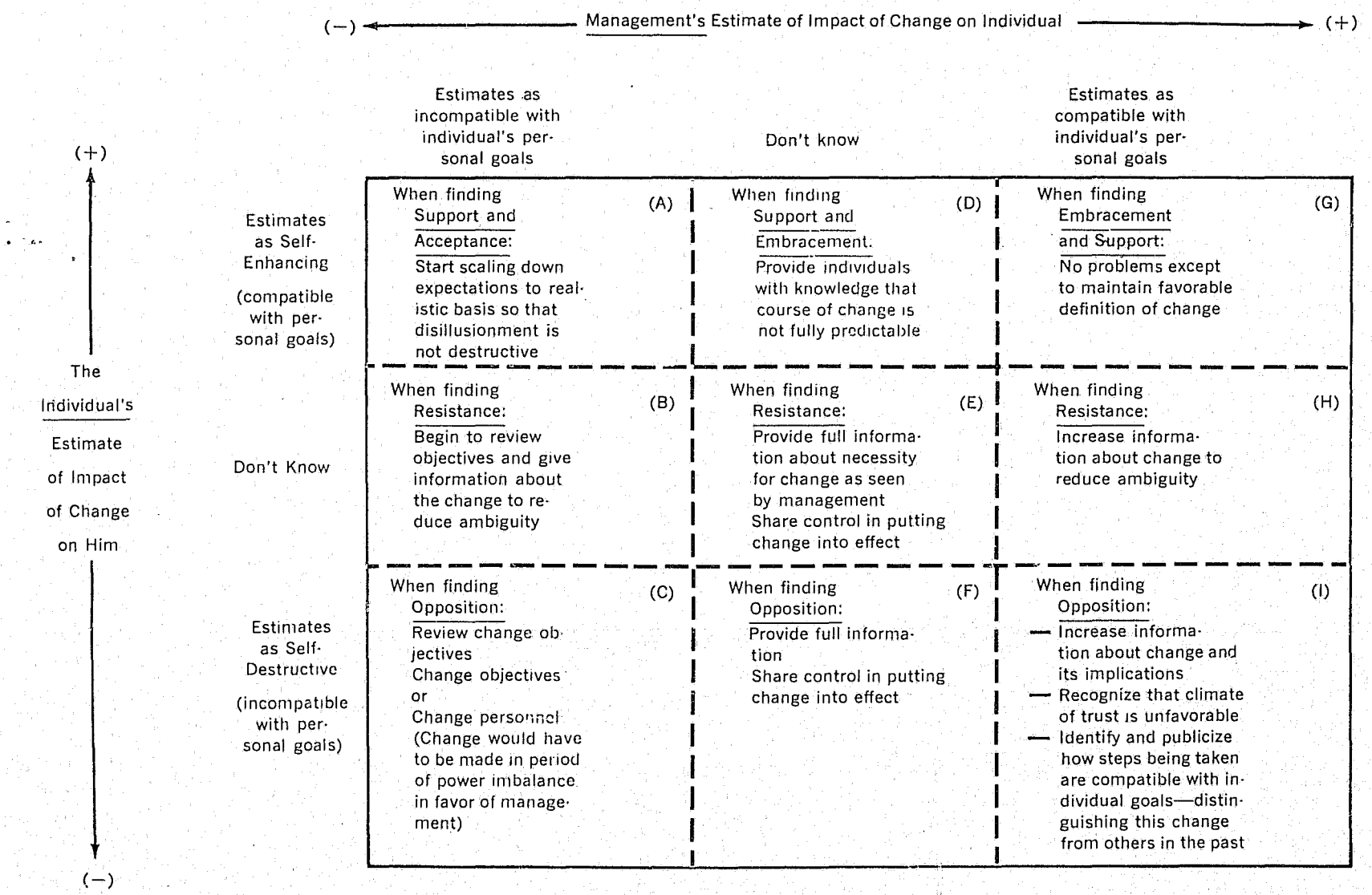


FIGURE 4
Strategies for Managing Change

181

KNOWLEDGE DISSEMINATION
Communication media
Utilization measures

CASE STUDY-ANALYSIS

Manpower Science Services, Inc. *Putting social science knowledge to use in the manpower system: An overview report.* Ann Arbor, Michigan: Manpower Science Services, Inc., 1974.

Purpose

This report summarizes methodology employed to disseminate social science knowledge for use in manpower agencies in a manner designed to increase the appropriate application of this knowledge to the task performance of manpower workers. Topics covered include:

1. Methods of locating, screening and identifying relevant and useful knowledge;
2. organizing and "packaging" it in such a way that it can be communicated inexpensively to potential users;
3. developing strategies which will enable potential users to become aware of the "package" and get direct exposure to the knowledge; and
4. increasing the adoption capacity of manpower agencies.

The authors describe methods used in the development of a manual on role modeling and role playing, a set of audiotapes plus workbooks on simulation, and a multi-media package of Group Leadership Techniques Workshop materials. The aim was to develop diffusable materials that would be of help to local manpower agencies endeavoring to adopt new methods. A total model for development work is generated, comprising retrieval, communication, diffusion, and adoption.

Method

Manpower Science Services, Inc. is a nonprofit corporation concerned with research and development in the social sciences. In this report they present an outline of their approach to studying the needs and services of manpower agencies and describe ways of communicating and applying knowledge relevant to these needs.

Findings and Conclusions

Manpower Science Services has developed and is testing a knowledge diffusion-utilization model for the manpower system. Four stages of the model are described:

1. *Retrieval and Organization of Social Science Knowledge.* Five topics are covered in this area: functions of retrieval, organization of retrieval activity, user participation in retrieval, methods for user participation, and applications to local projects.

2. *Media and Methods for Communicating Social Science-Based Innovations.* The authors discuss conditions for affecting content characteristics; conditions affecting methods of teaching and learning; conditions affecting choice of media; user participation in media and methods; and applications to local projects.

3. *Dissemination and Diffusion Strategies.* The report covers: relevant features of the manpower system; diffusion strategies; factors affecting diffusion; tracking and record-keeping; user participation and roles; and local applications.

4. *Increasing the Adoption Capacity of Manpower Agencies.* This section discusses characteristics of innovative organizations, both modifiable and indirectly modifiable, as well as local applications.

After outlining an organization structure for retrieval, diffusion, and utilization, the authors summarize operating principles in social science knowledge retrieval, diffusion, and utilization. They set forth the following themes:

(a) Unlike many technologies and methods in the field, those of Manpower Science Services are developed on the basis of existing research.
(b) The forms and processes used by Manpower Science Services for communicating knowledge are also based on research in the diffusion and utilization of innovations, and in organizational structure as it affects adoption of innovations.
(c) Applications of knowledge are made directly and concretely to manpower agency work. They are not generalized to other fields.

(d) Knowledge is put in the form of implementing actions; it is not disseminated at the cognitive or intellectual level.
(e) Knowledge-bearing products are composed of mass media components to avoid expensive use of experts.
(f) Tightly programmed methods are avoided in order to allow the user to adapt the knowledge to the local situation.
(g) Throughout each step in the process, line workers as potential users are involved as testers, critics, sources of information and judgment, and planners.
(h) Informal and personal contacts are used for access into the formal and official communication and diffusion system.
(i) An interdisciplinary collegial-professional type of organizational structure is required for institutionalizing the model.
(j) Innovation sponsors have no authority over the potential users but are dependent upon the users and on academic research institutions.

182

INNOVATION ADOPTION
Innovation: industrial
Innovation factors

EMPIRICAL STUDY

Mansfield, Edwin. The speed of response of firms to new techniques. *Quarterly Journal of Economics*, 1963, 77, 290-311.

Purpose

In industry, new techniques spread from firm to firm through the process of imitation of successful innovations. The purpose of this research was to study this imitation process and identify the factors responsible for the speed of adoption; that is, to determine those factors related to why some firms begin using a technique long before others.

Method

Four propositions were tested:

1. Other things being equal, the length of time a firm waits before using a new technique tends to be inversely related to the size of the firm.
2. As the size of a firm increases, the length of time it waits tends to decrease at an increasing rate.
3. Other factors being equal, the length of time a firm waits tends to be inversely related to the extent of the returns it obtains from the innovation.
4. As the profitability of a firm's investment in the innovation increases, the length of time the firm waits decreases at an increasing rate.

Data were collected regarding the diffusion of 14 innovations in a total of 294 firms in the bituminous coal, iron and steel, brewing, and railroad industries. These data were fitted to a mathematical model designed to test the four propositions.

Findings and Conclusions

In general the findings supported the hypotheses being tested. Four implications based on the findings are suggested:

1. The speed at which a firm responds to an investment opportunity is directly related to the profitability of the opportunity. That is, if the size of two firms is the same, and the innovation is considered more profitable for one firm than the other, the first firm will be quicker to introduce it.
2. The findings represent a contradiction of the popularly held view that large firms follow the small ones and are slow to introduce innovations. If profitability is held constant, the chances are good that a large firm will be quicker to use a new technique than a small firm.
3. A firm's financial health as measured by profitability, liquidity, and growth rate, bears no close relationship to how long it waits before introducing a new technique. The author suggests that, "The personality attributes, interests, training, and other characteristics of top and middle management may play a very important role in determining how quickly a firm introduces an innova-

tion" (p. 311). Mansfield also suggests that the presence or absence of a few key advocates may be a crucial factor in the adoption of an innovation.

4. It is dangerous to assume that certain firms are repeatedly the leaders or followers in introducing new techniques. A firm that is first in introducing one innovation is likely to be slow to introduce the next innovation.

183

INNOVATION: INDUSTRIAL
Organizational factors
Innovation factors
Innovation diffusion

CASE ANALYSIS

Mansfield, Edwin. *Industrial research and technological innovation: An econometric analysis.* New York: W. W. Norton, 1968.

Purpose

This book is devoted to industrial research and change as a result of technological innovations.

Method

The content of this book is based on the researches of the author and analysis of case studies.

Findings and Conclusions

1. *Size of Innovating Organizations.*

(a) Although it is often alleged that the largest firms do more than their share of innovating, it is not always the case.

(b) The largest organizations will do a disproportionately large share of the innovating in cases where—
   (1) the investment required to innovate is large relative to the size of the organizations that could use the innovation;
   (2) the minimum size of the organization required to use the innovation is large relative to the average size of similar organizations; and
   (3) the average size of the largest organizations is much greater than the average size of all potential users of the innovation.

2. *The Timing of Innovation.*

(a) The available evidence indicates that the average lag between invention and innovations is about 10-15 years in industry.

(b) Mechanical innovations require the shortest interval, and electronic innovations require the longest.

(c) The lag seems shorter for consumer products than for industrial products, and shorter for innovations developed with government funds than for those developed with private funds.

3. *Innovation and Growth.*

(a) Successful innovators grew more rapidly during a 5- to 10-year period after the innovation occurred than other like organizations, their average growth rate often being more than twice that of the others.

(b) In the period after they introduced the innovations, the difference in growth rate between innovators and other comparable organizations was greater than before the introduction of the innovation. According to the author's estimates, the average effect of a successful innovation raised an organization's annual growth rate by 4-13 percentage points depending on the time interval and the industry.

(c) Successful innovation has a much greater impact on a small firm's growth rate than on that of a large firm.

4. *Rate of Diffusion of Innovations.*

(a) The diffusion of a major new technique is a fairly slow process. Measured from the date of first commercial application, it often took 20 years or more for all the major firms in an industry to install an innovation. Seldom did

it take less than 10 years for diffusion.

(b) There seems to be a definite "bandwagon" or "contagion" effect. As the number of firms in an industry using an innovation increases, the probability of its adoption by a nonuser increases.

(c) As experience and information regarding an innovation accumulate, the risks associated with its introduction grow less and competitive pressures for adoption increase.

(d) The rate of diffusion tends to be higher for more profitable innovations and for those requiring relatively small investments.

5. *Characteristics of Leaders and Followers.*

(a) The speed with which a particular organization begins using a new technique is directly related to the firm's size and the profitability of its investment in the technique.

(b) The personality attributes, interest, training, and other characteristics of top and middle management may play a very important role in determining how quickly a firm introduces an innovation.

(c) The author found that there are dangers in assuming "once a leader always a leader" in introducing new techniques. According to these findings, there is a very good chance that a firm which is a leader in the adoption of one innovation may be relatively slow to introduce the next innovation when it comes along.

184

INNOVATION: EDUCATION
Organizational climate
Innovation factors

EMPIRICAL STUDY

Marcum, R. Laverne. *Organizational climate and the adoption of educational innovation.* Research Report for Office of Education, Contract No. OEG-4-7-078119-2901. Logan, Utah: Utah State University, March 1968.

Purpose

To identify the relationship of innovation adoption and characteristics of organizational climate.

Method

The initial step was to have the State Department of Education personnel from Oregon, Washington, Idaho, Nevada, and Utah help in selecting from each State 10 of the most innovative and 10 of the least innovative schools. An educational innovation checklist was then used to select from this sample 15 of the most innovative and 15 of the least innovative.

Details on the questionnaires used are as follows: The checklist of educational innovation has six main categories: scheduling, staff utilization, procedures, organization, curriculum, and facilities. Within each of these categories a number of possible innovations are listed. Each one is to be indicated as having not been implemented, as having been less than 25 percent involved, as having been from 25 to 75 percent involved, as having been more than 75 percent involved. A total score is then calculated for each school, previous responses being scaled 0, 1, 2, and 3.

The "Organizational Climate Description" questionnaire was given to the staff of each school for the purpose of identifying open and closed climate schools. The questionnaire has a number of items concerning behavior of teachers and administrators at school. Each item is to be checked as: (1) rarely occurs, (2) sometimes occurs, (3) often occurs, or (4) very frequently occurs. There are eight items of organizational climate, four characterizing teacher's behavior and four characterizing principal's behavior. On the teacher's side, disengagement refers to the teacher's tendency just to be going through the motions. Hindrance refers to the teacher's feeling that the principal burdens staff with busy work. Esprit refers to the teacher's morale. Intimacy refers to the teacher's enjoyment of friendly social relations with his or her peers. On the principal's side, aloofness refers to behavior by

which the principal is characterized as formal and impersonal. Production emphasis refers to straw boss "supervision" by the principal. Thrust refers to behavior in which the principal is trying to move the organization. Consideration refers to behavior in which the principal tries to treat the teachers humanly.

Findings and Conclusions

1. In an open climate there is high esprit, low disengagement, low hindrance, friendly relations but not particularly high intimacy. In this situation, the principal's behavior shows high thrust, high consideration, he is not aloof and does not have to emphasize production.

2. In the closed climate the opposite situation prevails; about all that seems to keep the teachers in the school is that they get satisfaction from their relationships with one another.

3. Statistical comparisons were made on a number of variables by means of the analysis of variance. The findings were as follows:

(a) Schools involved in innovation showed more open climates.
(b) Expenditures per student were higher in the most innovative schools.
(c) The professional staff was younger in the more innovative schools.
(d) Educators remained fewer numbers of years in the schools involved in innovative practices.
(e) The most innovative schools showed the larger number of professional staff.
(f) Administrators viewed the climate as more open, as did the teachers in the more innovative schools.

185

RESISTING CHANGE: HEALTH PROGRAMS

Attitude toward change

ANALYSIS

Marmor, J., Bernard, V., and Ottenberg, P. Psychodynamics of group opposition to health programs. *American Journal of Orthopsychiatry*, 1960, 30, 330-345.

Purpose

Health programs generally derive from scientific progress and recommendations. Despite this fact, it is not unusual for such programs to meet with intense and determined opposition on the part of various pressure groups. In this article the authors attempt to isolate the kinds of factors producing resistance to change.

Method

The authors focus on the various rational and irrational types of organized opposition typically aroused when a health innovation is advocated for community adoption. They draw on several examples such as the introduction of fluoride as they identify resistance factors.

Findings and Conclusions

1. The authors feel that changes which are allowed to take place spontaneously are less likely to arouse organized resistance.

2. When efforts are directed to promoting the adoption of health innovations, more resistance is also likely to develop.

3. The greater the promotion effort, the greater the opposition.

4. The resistance factors identified by the authors are neatly summarized in the following paragraph:

> Opposition to social change derives from factors which are external to the individual as well as internal within his psyche. Some of the external factors involved include threats to power, prestige, or economic security . . . the factor of coercion, problems of timing, the attitudes of leadership, and various educational, socio-economic, and cultural factors. The internal factors involved appear to be centered on feelings

of vulnerability in relation to the sense of bodily wholeness of the individual's life space.

5. In conclusion the authors stress the importance of the leadership role in both promoting and resisting change.

186

KNOWLEDGE DISSEMINATION
Research-practitioner gap
Communication factors

ANALYSIS

Marquis, D. G., and Allen, T. J. Communication patterns in applied technology. *American Psychologist*, 1966, 21, 1052-1060.

Purpose

Pointing out that "pure scientists" or researchers (fundamental) are only secondarily, if at all, concerned with practical utilization of their products, the authors investigate how individuals working in applied research, exploratory development, etc., obtain and exchange information. They then compare the nature of the communication process in science and technology.

Method

The authors draw on the findings of completed research studies as a basis for their analysis. They, in essence, review and summarize the existing literature on the information sources of scientists and technologists.

Findings and Conclusions

1. Scientists make much heavier use of literature and colleagues outside their organization than do technologists.

2. The customer and the vendor are two sources of information used by technologists that remain unused by the scientists. This results primarily from the fact that technologists are usually more directly involved in the marketplace.

3. Although technologists have journals, this body of literature lacks the characteristics of scientific literature. Citations to previous papers are fewer and are often to the author's own work.

4. There is less preoccupation with publication among technologists.

5. Scientists keep track of one another's work through visits, seminars, and small invitational conferences, supplemented by informal exchanges of written material long before it reaches archival publication. Technologists keep abreast of current developments related to their work primarily through close association with co-workers in their own organization.

6. Industrial and government laboratories with strong mission orientation and bureaucratic administrative structures usually cut themselves off from interaction beyond the organizational perimeter.

7. Technological literature is much less important than scientific literature. The unpublished reports are by far the most widely used of all written channels. The professionally produced journals are often useless, published for profit, and supported in whole or in part by the sale of advertising space.

8. There is little evidence of direct communication links between science and technology. There does exist a "gap filling" science (differentiated from frontier science) that does appear to be more directly responsive to technological need.

187

ORGANIZATIONAL CHANGE
Change strategies
Organizational climate

CASE STUDY-ANALYSIS

Marrow, A. J., Bowers, D. G., and Seashore, S. E. *Management by participation: Creating a climate for personal and organizational development.* New York: Harper & Row, 1967.

Purpose

To report on the changes in the functioning of an unsuccessful manufacturing plant upon the introduction of new management procedures.

Method

The book describes the two organizations involved in a merger—the one being successful, the other unsuccessful—and documents the changes produced by the introduction of the new management system.

Findings and Conclusions

1. The changes introduced cut across organizational structure, policies, work methods, and technology. They included the building of a new organizational climate with the introduction of participatory management at all levels.
2. A comparative study is reported of the results on human behavior and economic performance of different managerial styles.
3. Numerous suggestions for effective management are implied in the description of the detailed activities sponsored by the change agents who participated in the reorganizational effort.

188

CHANGES IN ATTITUDES
Organizational change

CASE STUDY

Marrow, A. J., and French, J. R. P., Jr. Changing a stereotype in industry. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 583-586.

Purpose

The project being reported has as its purpose the modification of a bias against the employment of older (post-30) women in a garment factory; the modification was motivated by a tight labor supply.

Method

The change in attitude was effected under the guidance of a staff psychologist. It was determined that management was adamant in its conviction that older women employees were less productive than the younger ones, took longer to learn a new skill, had a higher rate of absenteeism and a higher rate of turnover. A top management group became involved in designing and carrying out a modest research project to test the validity of these strongly held preconceived notions. The research demonstrated (see below) that older women were desirable employees in terms of criteria management itself had selected. At this point management was convinced, but supervisory employees still resisted the change. A process of reeducation was carried out in the plant. Subleaders took part in group discussions, exploring the motivation for the bias and developing insights concerning it. Eventually the group arrived at a decision recommending that an experiment be made in the training of older work-

ers—a decision which management supported because of its own factfinding activities.

Findings and Conclusions

1. The stereotype had no foundation in fact: The gathering and analysis of data indicated that older women not only equalled but surpassed the younger women in productivity; were able to learn skills slightly more rapidly; had a slight superiority in their attendance record; and a striking superiority in the turnover rate.

2. The stereotype survived among the supervisory level despite prestige suggestions by an experienced psychologist, by the personnel manager, by the plant manager, by the president of the company, and a combination of these.

3. Group discussion and decision brought about change among supervisors, as participation in research brought about change among management.

4. Facts are useful only when the stereotype bearer himself is reoriented in his search for a new solution.

5. Through a process of guided experiences which are equally his own, a person may reorient himself so that he gradually takes on within himself the attitudes which he would not accept from others.

189

KNOWLEDGE DISSEMINATION
Dissemination measures

EMPIRICAL STUDY

Matheson, N. W., and Sundland, D. M. Objectives of the FDI system for mental hospital personnel in Missouri. Paper presented at the Third International Congress of Medical Librarianship, Amsterdam, May 1969.

Purpose

This paper describes the results of an effort to identify user group variables in mental hospitals and measure the impact of different kinds of disseminated information.

Method

A questionnaire concerning sources of information was sent to 300 people, 209 were returned. Following this, an effort was made to develop a new information system (FDI).

Findings and Conclusions

1. In answer to a question concerning sources of information preferred after one's own library resources have been exhausted, the most popular choice was the university library, with friends ranking second. The next most used was public library, and trailing were NCMHR and NLM.

2. New book information came primarily from book reviews, friends, and publishers' notices.

3. Only 32 percent of respondents felt their institutional libraries were adequate, so new information sources were desired.

4. Although dissatisfaction with current libraries was evident, responders did not see much of the journal literature and were vague about their informational interests. They depended greatly on interpersonal exchange of information.

5. In developing a new informational system, group meetings were held at each institution; participants contacted one another by telephone, thus making use of their dependence on interpersonal contact. These methods proved to be fairly satisfactory and cooperation in these initial steps was a prerequisite of participation. The clinicians, who were the main mental health professionals in this study, tended not to use many resources, partly because their experiences with the literature showed little prospect of reward for the energy necessary to the search and secondly because of the common complaint that the researcher lacks interest in the practical applications of his work, so that the reporting literature does not make clear the clinical applicability of the research. As a consequence, many of the institutions in Missouri have essentially no libraries. They "consisted literally of books of such insufficient interest as not to be stolen."

6. "Significance in developing a behavioral sci-

ence information network in Missouri lay in determining what effect, if any, the confluence of the right person with the right information has; whether, indeed, placing research results on the mental health worker's desk under his nose would have any impact." Information in the behavioral sciences is rarely a life and death matter; still, vast sums are invested in mental health research, the results of which too infrequently reach the clinicians and administrators who might apply them.

7. FDI, the system developed, is designed to supplement existing information-gathering systems and to Xerox from the journals and mail information to users. "This system is a personalized service which directs to each individual only notification of articles, abstracts, and book reviews that have been coded for terms which fit into his individual subject profile interest. This is a pioneering project in the mental health field bearing some similarity to attempts in other disciplines."

8. The most usual response subjects made to how FDI had been of benefit was the amount of time conserved. FDI has also made an unexpected contribution to staff development. "Many of those in FDI pass on references and reprints to their colleagues who are not enrolled. This kind of feeding in of research findings at all levels of practice *hopefully* will stimulate a vigorous new growth in utilization of research in all areas of practice."

190

CHANGE STRATEGIES
Change in attitudes
Individual reeducation

ANALYSIS AND SUGGESTIONS

McClelland, David C. Toward a theory of motive acquisition. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 209-221.

Purpose

The paper seeks to set forth the propositions that underlie the process of bringing about a motive change.

Method

Using as a point of departure a realistic situation concerned with interesting students in a program designed to increase achievement motivation, and referring to extensive, pertinent literature, the author developed both his set of propositions and a chart that allocates the propositions to a number of independent, or input, variables, intervening variables, and output variables.

Findings and Conclusions

1. Factors influencing the acquisition (or strengthening) of a motive may be expressed in the following propositions:

(a) The more reason an individual has in advance to believe that he can, will, or should develop a motive, the more likely is the success of educational attempts to develop that motive.

(b) The more an individual perceives that developing a motive is consistent with the demands of reality (and reason), the more likely is the success of educational attempts to develop that motive.

(c) The more thoroughly an individual develops and clearly conceptualizes the associative network defining the motive, the more likely he is to develop the motive.

(d) The more the individual can link the newly developed network to related actions, the more likely is change to occur and endure in both thought and actions.

(e) The more the individual can link the newly developed conceptualized association-action complex (or motive) to events in his everyday life, the more likely the motive complex is to influence his thoughts and actions in situations outside the training experience.

(f) The more an individual can perceive and experience the newly conceptualized motive as an improvement in the self-image, the

more the motive is likely to influence his future thoughts and actions.

(g) The more an individual can perceive and experience the newly conceptualized motive as an improvement on prevailing cultural values, the more the motive is likely to influence his future thoughts and actions.

(h) The more an individual commits himself to achieving concrete goals in life related to the newly formed motive, the more the motive is likely to influence his future thoughts and actions.

(i) The more an individual keeps a record of his progress toward achieving goals to which he is committed, the more the newly formed motive is likely to influence his future thoughts and actions.

(j) Changes in motives are more likely to occur in an interpersonal atmosphere in which the individual feels warmly but honestly supported and respected by others as a person capable of guiding and directing his own future behavior.

(k) Changes in motives are more likely to occur the more the setting dramatizes the importance of self-study and lifts it out of the routine of everyday life.

(l) Changes in motives are more likely to occur and persist if the new motive is a sign of membership in a new reference group.

2. These propositions are associated with a set of input (or independent) intervening variables, and of output variables encompassing such elements as the following: (a) goal setting for the person; (b) acquisition of achievement need associative networks; (c) relating new networks to superordinate networks; (d) personal goal setting; (e) knowledge of progress; (f) personal warmth and support; and (g) support of reference group.

191

RESEARCH UTILIZATION
Innovation characteristics
Utilization factors

ANALYTICAL MODEL

McClelland, W. A. The process of effecting change. Presidential address to the Division of Military Psychology, American Psychological Association, September 1968.

Purpose

Dr. McClelland has been involved in research and development in military psychology for over 25 years and is currently working with the Human Resources Research Office (HumRRO) at George Washington University. His purpose is to suggest ways of moving from research to development to application and use.

Method

He reviews the literature that is relevant to the points he wants to make and draws on his experience to make a model of the means of getting research applied in practical situations.

Findings and Conclusions

1. The historical record indicates that the findings of research are not quickly utilized. It took about 50 years for complete diffusion of such practical invention as the kindergarten to take place. HumRRO's experience with the Army utilization of R&D indicates the range of time from completion of research to implementation ranges from a few weeks to over 10 years.

2. There are three fallacies concerning the utilization of research that Dr. McClelland does not believe are justified:

(a) A good product will succeed on its own merits. He points out that reports are often filed away and forgotten or are ignored in some other way.

(b) No further attention is required once an in-

novation is introduced (obviously a plan for maintenance and feedback is necessary).

(c) There is an orderly process from research to development to use (actually there is a great deal of crossing back and forth among research, development, and use).

3. There is a large gap between theory and practice in education due to: diffuse goals, lack of knowledge on how to engineer innovations, the lack of evaluation and feedback, management, and funding problems, and finally, attitudes of suspicion and fear on the part of educators.

4. A review of the literature led to the following "characteristics of innovators": (a) they "get around" outside of their normal environment; (b) they tend to be younger; (c) they are familiar with research, development, and use activities; (d) organizations or individuals who are more affluent tend to be earlier adopters; (e) there is little literature on the personal attributes of successful innovators except that they are not the most comfortable persons to have around, which may be partially due to people's general resistance to change.

5. Guba's (1968) paper on the means of implementing change is discussed and the idea that the client is rational and will follow logical evidence was criticized for being "a bit naive."

6. There is no best way to manage change in complex enterprises.

7. A list of criteria for evaluating change models is given in terms of provisions for the following factors:

(a) Mutual recognition of the change agent and client system roles.
(b) Means of affecting the direction, temper, and quality of change.
(c) Evaluation of cost effectiveness.
(d) Diagnosis of strengths and weaknesses.
(e) Definition of the time required for a continuing relationship.
(f) The model can be communicated realistically without distortion.
(g) Criteria for assessing when the model is applicable and when it is not.
(h) Usefulness to people with different backgrounds.
(i) Means for detecting gaps in theory and practice.

8. Two premodels of change are suggested:

(a) *The interpersonal paradigm*—this is based on an adaptation of a more general model of Rogers (1968) which has three general stages: antecedents, process, and results. Under antecedents McClelland lists change-agent characteristics, client's characteristics and perception of the situation, and change agent's perception of the situation. Under process he places information sources such as awareness, interest, evaluation, trial, and decision. He also includes the perceived characteristics of the innovation (advantages, compatibility, complexity, and divisibility) under the process heading. The results section includes such features as client feedback, and factors leading to continued adoption or continued nonadoption.

(b) *The interorganizational paradigm*—this follows the concept of research through development to use. The paradigm has three broad sections: requirements for research (including such factors as the characteristics and requirements of the client system and the characteristics of the R&D agency), the conduct of R&D (including research, report writing, and mutual determination of action implications), and finally the decision process based upon the research findings. This paradigm is based on the assumption that extensive, meaningful documentation is required. This model is basically an elaboration of the one HumRRO has evolved over a period of working with the Army for 17 years.

192

KNOWLEDGE DISSEMINATION: SCIENCE

Dissemination factors
Communication model

ANALYTICAL MODEL

Menzel, Herbert A. Scientific communication: Five themes from social science research. *American Psychologist,* 1966, 21, 999-1004.

Purpose

From research done during the past 20 years Menzel identifies five themes that describe the flow of information from researchers to potential users.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. *Acts of Scientific Communication Constitute a System*—it is necessary to look upon any one arrangement, institution, facility as a component of the total system, which includes all the provisions, all the facilities, all the occasions and arrangements, and all the customs in the discipline that determine the transmission of research information.

2. *Several Channels May Act Synergistically to Bring About the Effective Transmission of a Message*—different communication channels are linked together in the system. "Information must often be publicized repeatedly or through diverse channels before it will enter the stream of communications which will lead to its ultimate user; and from the point of view of the consumer of information, it is frequently necessary to be exposed to the information repeatedly before it will make an impact (Menzel, 1958, pp. 14-17, 32-49, 92-124)."

3. *Informal and Unplanned Communication Plays a Crucial Role in the Science Information System*—Menzel cites much empirical evidence for this generalization. The informal flow of information is usually regular. Certain individuals tend to be the most frequent carriers and there is often regularity in kinds of occasions, places, and times at which these information exchanges occur—i.e., labs, corridors, during coffee breaks, at conferences, etc.

"Information that helps interpret results and information that helps a person become acquainted with a new field also seem to make their way differentially, often through interpersonal channels (APA, 1965, report No. 11; Menzel, 1959, Rosenbloom, McLaughlin, and Wolek, 1965)."

4. *Scientists Constitute Publics*—the populations served by the science information system, that is, scientific researchers, and practitioners in various disciplines and professions can be usefully looked upon as publics. These publics in turn can be characterized by their communication behavior and information transmission planned accordingly.

5. *Science Information Systems Serve Multiple Functions*—the functions include: the exhaustive search; the reference function; current awareness function, which consists of stimulating researchers from time to time to seek information outside of their designated areas of attention; and a function which consists of enabling a scientist to follow through in this stimulation by "brushing up" or familiarizing himself with a well-defined field of inquiry which he had not previously included in his attention area.

193

RESEARCH-PRACTITIONER COLLABORATION

Research survey: mental health
Community research

CASE STUDY

Mercer, J. R., Dingman, H. F., and Tarjan, G. Involvement, feedback, and mutuality: Principles for conducting mental health research in the community. *American Journal of Psychiatry*, 1964, 121(3), 228-237.

Purpose

To give an account of the principles and techniques employed to cope with the problem of project-community relationships by a research project studying mental retardation, an area closely related to mental health. The procedures are credited with the successful conclusion of fieldwork.

Method

The research project was an intensive epidemiological study of a medium-sized urban community in southern California for the purpose of identifying mentally retarded persons in the community.

Four aspects of the research plan were anticipated to create special problems in maintaining harmonious relations with the community:

(a) *Saturation sample*—because of the need to include all cases in the sample and the distribution of cases throughout all segments of the community, inevitably there was the nearly total involvement of the city in the study. The recognized procedure of entering a community with little advance notice, negotiating individually for each interview, and leaving quietly could not be followed.

(b) *Nature of the research problem*—the study had to be presented to the community in a manner that would secure cooperation of respondents in a study which could be perceived as potentially damaging to their own self-esteem.

(c) *Intelligence testing of a subsample*—one-sixth of the sample required additional contacts and additional cooperation.

(d) *Longitudinal design*—plans for additional study meant that the active cooperation of the community was essential.

Findings and Conclusions

The study was guided by a "philosophy" consisting of three fundamental principles:

1. *Involvement*—those persons in the community power structure holding key positions in relation to the mentally retarded (the project subject/sample) should be involved from the beginning as consultants or staff.

(a) This particular study involved: the director of Pupil Personnel Services and the Director of Special Education (both appointed by the Superintendent of city schools); the Chief County Probation Officer and his Deputy in charge of court commitments; the Director of Psychological Services for county schools; a high administrative officer of the local branch of a State university; and, two members of the staff of the sociology department.

(b) The value of having these persons involved in the project was proven repeatedly. For example, the initial skepticism of the local newspaper publisher toward the project was dispelled after discussion with the university official. The key officials also helped in interpreting the study to other city officials and in legitimizing project activities with the citizenry.

2. *Feedback*—through continuous contact with the project provided by regular meetings of the advisory group, community leaders were constantly informed of the current problems being faced by the research staff. The advisory group was made up of the consultants from community social agencies and prominent social scientists.

(a) The continuous information chain enabled community leaders to utilize the information feedback advantageously in their own work and assured them of a priority of knowledge.

(b) Cognizance of project problems often re-

sulted in valuable assistance from community leaders. For example, the consultants from the schools suggested using teachers as interviewers during summer vacation and were instrumental in recruiting what proved to be an efficient and devoted corps of workers.

3. *Mutuality*—whenever possible, plans were formulated so that the research effort would not only advance specific project interests but would prove useful to participating agencies. This particularly applied to the kinds of data collected.

Also, whenever feasible, agency records were analyzed by agency staff members employed by the project. Staff members interested in research in project-related topics were encouraged and assisted in generating and analyzing data.

4. Based on experience with this community research effort, several suggestions are made for the conduct of such a study:

(a) Pretesting field procedures in a different community from that utilized for the final study provided valuable information for the final fieldwork.
(b) Establishing contact with significant community agencies in advance of the fieldwork, judicious use of newspaper publicity, and the projecting of a project image acceptable to the community were found to be useful in developing favorable community-project relations.
(c) Careful timing of fieldwork, recognition of ethnic factors in selecting and assigning interviewers, and dealing continuously with problems of staff morale were also involved in achieving a 90.96-percent completion rate for the initial screening interview and an 86.6-percent rate for sub-sample testing.

194

INNOVATION: EDUCATION
Change process
Innovation characteristics
Innovation factors

ANALYTICAL MODEL

Miles, Matthew B. Innovation in education: Some generalizations. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 631-662.

Purpose

As the final chapter of the above book, this paper reviews generalizations made explicitly or implicitly in preceding chapters.

Method

The author has synthesized the points relevant to innovation made throughout the book.

Findings and Conclusions

1. Although the merits of the innovation itself are rarely the major determinants with respect to adoption, some of the properties of the innovation do have a bearing on adoption.

(a) Innovations requiring inordinate outlays of money, energy, or time by the adopting person or group are likely to move slowly.
(b) Technological innovations are relatively easy to adopt; such innovations are equally easy to reject or discontinue.
(c) Supporting materials (teaching aids, manuals, etc.) aid the diffusion of educational innovation.
(d) Innovations with built-in implementation supports (such as special training for practitioners) diffuse more rapidly than those not so supported.
(e) Innovations must be congruent with the potentially adopting system. Those which are perceived as threats to existing practice are less likely to be accepted; those which can be added to an existing program without seriously disturbing other parts of it are likely to be adopted.

2. Most innovations appear to be stimulated, triggered, and nurtured by some active person or group, either external to the innovation-receiving system or within that system. The following generalizations are made about the characteristics of these innovators.

(a) The innovator is not an isolated hero. He must recognize and accommodate to his interdependence with others (co-workers, the institution, the external community, etc.).
(b) The innovative person tends to be in a position of authority within the system. He is often strong, intelligent, enthusiastic, creative, and skilled in interpersonal relationships. It is, however, not uncommon for innovators to be rebellious, impractical, or emotionally unstable.
(c) Innovations sponsored by a group rather than an individual are more likely to be moderate rather than radical in nature.
(d) Group acceptance and implementation of an innovation is facilitated through the creation of a temporary system.

3. The following characteristics of the target system are relevant to the acceptance or rejection of innovation.

(a) Generally speaking, within any given system, there are more forces working for stability than for change.
(b) Zeitgeist affects change; the author believes that there are many features in American society that presently support innovation.
(c) Internal conditions conducive to the acceptance of change include the need to accommodate the growth, discrepancy between ideals and existing practice, and conflict among subsystems.
(d) Innovativeness varies directly with available money.

4. The process of implementing change needs careful study, planning, and experimental work.

(a) Among the strategies which aid in effective implementation are: comprehensive attention to all stages of the diffusion process; creation of new structures, especially by systems outside the target system; congruence with prevalent ideology in the target system; reduction of pressures on relevant decision makers; use of linkage between existing structures or between old and new structures.
(b) Different formulations are offered concerning the stages of the change process.
    (1) One formulation identifies the following stages: development of awareness and interest concerning the innovation; reaching a judgmental decision about the potential rewards and costs of the innovation; actual trial of the innovation within the system; decision to adopt, adapt, or reject.
    (2) Another formulation includes these stages: criticism of existing programs; presentation of proposed changes; review and reformulation of proposals and comparison of alternate proposals; action decisions; implementation of action decisions.
(c) The following optimal conditions are identified in relation to the stages of the change process.
    (1) Effective design of innovation requires a protected, enriched, autonomous environment.
    (2) In the development of awareness/interest, credibility is crucial. It can be aided if a genuinely dispassionate group serves as a clearinghouse for information on an incipient innovation.
    (3) Making an evaluative judgment is easier when potential adopters can visit and actually observe the operation of innovations.
    (4) During the initial period of an innovation's use, the user needs generous support and help.
(d) Adequate linkage between innovating groups and target systems can be facilitated if innovators are chosen so as to have a direct, preexisting relationship with persons responsible for making political or financial decisions relevant to the innovation. Reasonably stable tenure in the innovating group is also helpful.

5. Many innovations, once accepted, are continued without valid and dispassionate evaluation concerning effectiveness; likewise many innovations have a short life and are abandoned without rational evaluation. The fate of innovations—and the underlying reasons for the fate—needs further exploration.

195

CHANGE PROCESS
Change strategies
Group dynamics
Change via temporary systems

ANALYSIS

Miles, Matthew B. On temporary systems. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 437-490.

Purpose

The focus of this paper is the use of temporary systems to bring about change in persons, groups, and organizations.

Method

The author draws upon case material, but the method is primarily analytical.

Findings and Conclusions

1. Permanent systems find it difficult to accomplish change. Their energies are devoted primarily to carrying out routine goal-directed activities and to maintaining existing relationships within the system. Other antichange forces (defective communication, status consideration, etc.) also serve to block the introduction of change.

2. Temporary systems (such as the psychotherapeutic relationship, the religious retreat, goal-directed workshops and conferences, the pilot project, and the consultant-client relationship) prove to be effective mechanisms for inducing change.

3. Change-inducing temporary systems can be functionally differentiated as follows: treatment, reeducation, and education.

4. Temporary systems have the following *input* characteristics—that is, characteristics which appear at the time of setting up the system:

(a) They are expected by the participants to terminate at a specific point in time or when some specific event has occurred (such as: a problem solved, a report finished).

(b) The initial goal is clearly defined and limited. Members do not anxiously confront a limitless and unachievable task.

(c) There is usually close specification of the classes of personnel who may enter the system for its limited life. This often reduces internal conflict and bypasses problems of status maintenance.

(d) Participants are usually separated—socially and physically—from their ordinary pursuits. A cultural island facilitates contemplation of change and provides some protection to participants.

(e) Generally speaking, the temporary system will more readily accomplish its goals if it is small in size and if it is housed in a physically limited territory (one hotel, a single meeting room).

5. Temporary systems have the following *process* characteristics:

(a) They provide participants with coherent, narrowed time perspective. Postponement of activity is discouraged. Use of directed energy is increased. The use of time is so concentrated that there is often a distorted perception of elapsed time.

(b) Goals are redefined as new understandings develop and communications improve. This reformulation of goals as a group process serves to fully engage the participants in the world of the temporary system.

(c) There is precise specification of the "rules of the game." This serves to make the system controllable, predictable, and compelling (that is, participants will perform unusual or difficult tasks because they are part of the given procedures).

(d) The participant is freed from his usual role conflicts and has the opportunity for role redefinition and refashioning of his identity. He has the opportunity for risk-free experimentation with new roles.

(e) Temporary systems encourage a special form of communications: A common language with special meanings for the participants tends to develop; new channels of information transmission open up between persons whose roles in former permanent systems kept them apart; there is a tendency, as they

share more information with each other, for participants to become more open and trusting.

(f) The temporary system has its own power system. Productive work does not get underway until the power structure is clear to all. There is a tendency for equalitarian notions of power distribution to develop. The net influence of any one individual on the system can be substantial.

(g) Characteristic states of feeling during the process include an early defensiveness, an emerging atmosphere of play, a developing interpersonal liking and acceptance, an esprit de corps, and finally a deep sense of involvement.

(h) It is relatively easy to develop new norms in a temporary system; they can become internalized as attitudes in the person are carried over as practices into permanent organizations. Among the typical norms generated by temporary systems: equalitarianism, authenticity, inquiry, hypotheticality, "newism," effortfulness.

6. Temporary systems have the following *output* characteristics:

(a) There can be changes in the durable, continuing aspects of individuals' attitudes, knowledge, or behavior.

(b) Membership in a temporary system can durably alter the quality of preexisting relationships among members of the system.

(c) Action decisions can emerge from temporary systems.

7. The author makes the point that despite the suitability of temporary systems in the accomplishing of change, they do have certain characteristic problems.

(a) Participants may be overloaded, overstimulated, emerge with the feeling that they need decompression time.

(b) The system may aspire toward grandiose, unattainable goals.

(c) The intensive climate calls for demanding process skills which are not always provided.

(d) The short-term isolation from the surrounding environment may generate long-term alienation when members return to the permanent system.

(e) Failure of linkage between temporary and permanent systems can short-circuit the accomplishments of the former.

196

PLANNED CHANGE: EDUCATION

Change strategies
Organizational factors
Organizational climate

ANALYSIS

Miles, Matthew B. Planned change and organizational health: Figure and ground. In R. O. Carlson, et al., *Change processes in the public schools.* Eugene, Ore.: Center for the Advanced Study of Education Administration, University of Oregon, 1965, pp. 11-34.

Purpose

It is the author's conviction that those concerned with innovation have tended to focus primarily on the efficacy of the innovation itself and to neglect the readiness of a specific organization to absorb the innovation. Accordingly, his purpose in this paper is to correct that deficit and to pinpoint factors of organizational health in relation to utilization of innovation.

Method

The paper was developed by analytical consideration of the issues with considerable use of published materials by other specialists in the field of planned change.

Findings and Conclusions

1. The author formulates the following dimensions of organizational health:

(a) In a healthy organization, the *goals* of the system are reasonably clear to the system members and reasonably well accepted by them. The goals must also be achievable with existing or available resources, and must be appropriate.
(b) There should be relatively distortion-free *communication*, vertically, horizontally, and across the boundary of the system to and from the surrounding environment.
(c) The distribution of *influence* should be relatively equitable. Subordinates can influence upward, and intergroup struggles for power are not bitter.
(d) When there is organization health, the syster's *resources*—particularly its personnel—are used effectively. People may work hard, but they do not feel that they are working against themselves or against the organization.
(e) A healthy organization has *cohesiveness*. Its members are attracted to it, want to stay with it, be influenced by it, and collaboratively exert their own influence.
(f) A healthy organization is *innovative*. It tends to develop new procedures, move toward new goals, produce new kinds of products, diversify itself, and become more rather than less differentiated over time.
(g) A healthy organization has *autonomy*. It does not respond passively to demands from the outside nor does it respond destructively or rebelliously to perceived demands. It has a sense of independence from the environment.
(h) A healthy organization has sufficient capacity for *adaptation* so that, when environmental demands and organization resources do not match, a problem-solving, restructuring approach evolves in which both the environment and the organization undergo change. The organization, if it is healthy, has enough stability and stress tolerance to manage the difficulties which occur during the adaptation process.
(i) A healthy organization has *problem-solving adequacy*. This encompasses well-developed structures and procedures for sensing the existence of problems, for inventing possible solutions, for deciding on the solutions, for implementing them, and for evaluating their effectiveness.

2. Educational organizations have certain special properties which tend to diminish their organizational effectiveness. These include goal ambiquity, input variability (that is, they must accept a wide range of pupils), role performance invisibility, low interdependence, vulnerability, lay-professional control problems, and low-technological investment.

3. Specific interventions are suggested to improve organizational health.

(a) *Team training*—members of an intact work group meet for a period of days away from their offices, with constant help, to improve their effectiveness as a problem-solving team.
(b) *Survey feedback*—attitudes, opinions, and beliefs of members of an organization are collected by survey; findings are provided members of the group who examine them and plan changes accordingly.
(c) *Role workshop*—all people in a particular role within an organization meet to examine role expectations others hold for them, the fit between their own wishes and these expectations, their actual role performance, etc.
(d) *Target setting and supporting activities*—periodic meetings are held between supervisor and each of his subordinates separately to set targets for work and personal development. Targets are reviewed from time to time. Activities directed toward achievement of goals (conferences, workshops, academic courses, etc.) are provided.
(e) *Organizational diagnosis and problem solving*—this can be accomplished by residential meetings of top members of a work group to identify problems and develop solutions. Emphasis is less on interpersonal effectiveness than on system-wide problems.

4. The foregoing means of intervention have these common principles: self-study, relational emphasis, increased data flow, norms which function as a change agent, temporary system approach, and expert facilitation.

197

GROUP DYNAMICS
Change process: mental health
Attitudes toward change

EMPIRICAL STUDY

Miles, M., Hornstein, H., Calder, P., Callahan, D., and Schiavo, R. Data feedback: A rationale. In H. A. Hornstein, B. B. Bunker, W. E. Burke, M. Gindes, and R. J. Lewicki (Eds.), *Social intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

To describe the process of survey feedback and to present arguments concerning its effectiveness as a method of planned organizational change.

Method

Descriptive analysis

Findings and Conclusions

1. *Presentation of data.* In survey feedback the client system examines data about itself. The data may *corroborate* the client's feelings, the data may have a *disconfirming* effect if they contradict beliefs, or they may have *inquiry-encouraging* effects so that the clients begin to wonder why people responded as they did. These effects tend to encourage acceptance of the data, especially when the client group has collaborated in data collections.

2. *Meetings.* Survey feedback insures the group's responsibility for survey feedback meetings by having the meetings organized around the existing work structures, and by having each family workgroup conduct its own meeting. Thus, the client group becomes its own change agent. Group members have responsibility for conducting and scheduling meetings and for making and implementing action decisions.

The increased interaction which results from these meetings has three effects:

(a) Increased liking among the parties who interact
(b) Increased pressure for clarifying one's position on relevant issues
(c) Increased pressure for conformity to group norms

3. *Process analysis.* In the beginning, staff members are the primary source for process analysis. They make comments on such things as interpersonal interactions, norms, and problem-solving procedures. Other members of the group begin to think reflexively, and to comment on the group's process and the behavior of others explicitly.

As the group's process is focused upon and diagnosed, two things occur:

(a) Members of the group inhibit old behaviors and attempt to practice new behaviors in response to the feedback they are receiving about their current behavior.
(b) The group develops norms which facilitate productive work by enabling direct expression of feeling, and self-corrective behavior when group problem solving is effective.

Two sets of norms are most critical:

(a) The first set is in operation as soon as the group accepts process feedback and facilitates the *communication of information.*
(b) The second set rewards collaborative activity and affects communication, determination of goals, group cohesiveness, and group pressures for conformity.

198

RESEARCH UTILIZATION: REHABILITATION

Utilization measures
Knowledge dissemination

ANALYSIS AND SUGGESTIONS

Moriarty, Edward J. Summary of small group recommendations. *Communication, dissemination, and utilization of rehabilitation research information.* Washington, D. C.: Joint Liaison Committee of the Council of State Administrators of Vocational Rehabilitation and the Rehabilitation Counselor Educators, Department of Health, Education, and Welfare, 1967, Studies in Rehabilitation Counselor Training, No. 5, pp. 72-73.

Purpose

To summarize the recommendations made by the small discussion groups at a conference on Rehabilitation Counselor Training held in December 1966.

Method

The author himself served as general group recorder at the conference. His approach to the task of summarizing is not outlined, but the reports of the individual small groups are attached as an appendix to the monograph.

Findings and Conclusions

The summarized recommendations are quoted in full text below:

1. That the counselor be seen as a target for research utilization, and that the counselor be viewed within his total environment, which will include his community, supervisors, consultants, administrators, budget, and the general climate in which he works.

2. That statewide planning activities pay careful attention to research findings as they proceed.

3. That State agencies seek closer ties with universities, as they become involved with statewide planning.

4. That research grants being approved be evaluated on a utilization criterion as well as other research standards.

5. That, in considering dissemination, the criteria of getting the right material into the right hands at the right time be emphasized.

6. That human values not be ignored when information concerning rehabilitation is computerized.

7. That there be better coordination between the research efforts of various agencies and that the VRA stick to projects clearly within the field of rehabilitation.

8. That humanistic values influence agency program development and that research findings are not always needed to justify attempts to help people. Research programs should be oriented toward assessing and evaluating as results are achieved.

9. That the VRA form a committee of State agency personnel to help identify research needed to help State agency programs.

10. That specific budgets be established for operational research in State agencies.

11. That sensitivity training, through T-groups, be established to help develop receptivity in target groups.

12. That there be established cooperative university-agency mobile research and innovation teams.

13. That priority be given to the development of storage and retrieval systems.

14. That research seminars for administrators, supervisors, and counselors be established.

15. That the *Rehabilitation Record* contain a tearout, research section written by a science writer, knowledgeable in rehabilitation.

16. That research either proposed or completed be evaluated with respect to—

(a) its relevance to the counselor's work and problems;
(b) the involvement of the counselor with respect to research being considered; and
(c) the payoff possibilities as related to the counselor in the field.

17. That research be conducted in two areas—

(a) ways and means of increasing receptivity to research ideas; and
(b) ways and means of increasing utilization of

research findings by counselors and supervisors.

18. That laboratories be established to test out new ideas and to serve as agencies of change.

19. That there be a public educator in each agency.

20. That a counselor advisory committee on research be established.

21. That the VRA construct mailing lists to supplement those of the research and the development centers.

199

RESEARCHER-PRACTITIONER RELATIONSHIPS

Research utilization: rehabilitation

ANALYSIS

Nagi, Saad Z. The practitioner as a partner in research. *Rehabilitation Record*, July-August 1965, 1-4

Purpose

In order for any professional field such as rehabilitation to thrive and grow, there must be knowledge and learning as well as practice and service. To serve this end, the partnership between practitioners and researchers is vital. The author discusses the basis of this need, the differences between these two specialized activities, and the factors involved in achieving a closer unity of research and practice.

Method

This paper was developed from the observations and knowledge of the author.

Findings and Conclusions

1. Since practice involves the application of available techniques, this can serve as the ultimate test not only of the effectiveness of the techniques themselves, but also of the validity of the theoretical structure from which the techniques developed.

2. The state of the art of the practice disciplines based upon the social and behavioral sciences is quite crude in comparison to those derived from the physical sciences. In the case of rehabilitation, there is a glaring inadequacy in the understanding of the behavioral aspects of disability and the ineffectiveness of existing techniques for dealing with it.

3. The development of a comprehensive, dy- theory of disability would require the pooling gether of both the experiences and insight of the practitioner and the theoretical and methodological sophistication of the researcher. This would require four activities:

(a) Establishing close ties with the basic disciplines through curricula planning in the applied fields, continued interest on the part of practitioners, and attracting researchers well grounded in these disciplines.

(b) Closing the gap between theoretical and applied research, especially in the social and behavioral aspects of disability, since the implications of many contemporary theories have not been studied.

(c) Closing the gap between the availability and the utilization of research findings.

(d) Establishing means of feedback so that researchers would learn about the practitioners' experiences with research results and their observations about the conditions under which these results hold or deviate.

4. The last two of the above activities would require overcoming barriers in communication, which the author believes can best be accomplished through workshops, seminars, programs of career development for both practitioners and researchers, and a common commitment to understanding the total picture of disability.

5. In addition to the problem of communication, other obstacles to productive cooperation can be identified as deriving from the conflicting orientations of the researcher and practitioner:

(a) The controversy over the appropriateness of the clinical versus the statistical approach to

inquiry. Both approaches are needed, and can be fruitfully combined by statistical analysis of clinically collected data and vice versa.

(b) Practitioners are oriented toward uniqueness while researchers are oriented toward patterns. Actually these two orientations are interdependent, since knowledge of patterns is necessary in identifying uniqueness, and practitioners can contribute valuable input to research through the systematic accounting of the conditions under which uniquenesses emerge.

(c) The issue of the tentativeness or finality of information causes conflict, since researchers hold information as tentative while practitioners require information that they can act upon with confidence in therapeutic or counseling situations.

(d) The need for controls in research operations causes considerable problems in the applied setting, since the research design may be viewed by practitioners as hindering the provision of optimal services. The author suggests that the provision of services should not be a goal in itself but should be aimed at the testing and improvement of the services themselves and at contributing to the rehabilitation and welfare of the client. Dr. Nagi does not see these two goals as necessarily incompatible as long as the research objectives and design do not violate any ethical standards or the orientation toward human welfare.

200

RESEARCH UTILIZATION
Change models
Change agency

ANALYTICAL MODEL

National Institute of Education. *Building capacity for renewal and reform: An initial report on knowledge production and utilization in education.* Washington, D.C.: National Institute of Education, 1973.

Purpose

The purpose of this report by the Task Force on Resources Planning and Analysis of the NIE's Office of Research and Development Resources is to describe the initiative of the Institute in its attempt "to build organizational capacity of the R&D community to create information and alternative practices and products of value to educators, the capacity of a variety of agencies to link research to practice, and the capacity of schools and State agencies to engage in a process of continuous improvement that makes the most effective use of local resources as well as the products of external R&D." The description is accompanied by a conceptualization of the knowledge production and utilization system which provides a framework for sets of recommendations relative to the strengthening of the R&D system, the building of a linkage and support system, and the building of problem-solving capacity in the operating system.

Method

The method is one of analysis and suggestion relative to the implementation of the provision of the Education Amendments Act of 1972 which declared it to be the policy of the United States, along with related objectives bearing on the advancement of American education, to "build an effective educational research and development system." The Task Force viewed this objective in broad terms. It first critically examined past policy decisions, which in their opinion "created a system of external agents, new institutions for the most part, anchored neither in any well-tested scholarly understanding of a domain of practice, nor in any intimate knowledge of operational problems." Consequently, the method and scope of the analysis went beyond the confines of existing institutions and was not limited solely to their rearrangements. The Task Force felt that "the revised concept of the 'R&D system' must include attention to how and by whom problems get formulated in the first place;

to what might be a range of likely resources for solving them, whether through systematic external development or some other means; and to the organizational life of operating systems which will affect the possibility of implanting the solution to a problem."

Findings and Conclusions

1. The history of significant Federal support for educational research and development, beginning with the Cooperative Research Act in 1954 to the establishment in 1972 of the National Institute of Education as a separate Federal agency, is marked by varying emphasis on research, development, and dissemination as well as by varying stress on the amount of participation by universities, independent nonprofit organizations, profit-oriented organizations, and local school systems and State agencies.

2. The rapid growth of funds for R&D during the 60's led to a significant increase of professional personnel with a shift in stress from research to development and an unevenness in qualifications for the required task. Emphasis shifted as well in respect to the aspect of the educational process, with curriculum materials and teaching techniques receiving higher priority over basic research.

3. Although difficult to assess, the impact of Government on sponsored R&D activity in education has been judged to have been less effective than might be, and the need for a better linkage and support system has been increasingly recognized.

4. Research and development will influence practice in the schools only to the extent the needs, values, incentives, and ideas of practitioners are reflected. Also, R&D must be in keeping with the characteristics of the educational operating system, both at local and State levels.

5. In enhancing renewal, innovation, and knowledge utilization in the operating educational system a major thrust is needed toward building organizational capacity and resources in terms of the individual teacher, the school, the school district, the community, and the State.

6. The development of resources for problem solving can be furthered by the employment of an interactive model of educational change which distinguishes between the local and State operating systems (LEA's and SEA's) on the one hand and the external resource system on the other. Certain considerations are suggested:

(a) The institutional relationships among the Government, universities, nonprofit organizations, and industry need to be re-examined.

(b) External linkage and support requires the operation of a comprehensive information system linking all the participants in the resource and operating systems with the external institutions involved in delivering products and related technical assistance to the schools.

(c) The concept of internal R&D implies that the elements of the operating system, both in SEA's and LEA's, should be regarded as legitimate performers of R&D, albeit with less emphasis on basic research and a far less rigorous process of development/field testing/evaluation.

(d) Internal problem solving by LEA's requires that practitioners be thought of, not as passive and unaware consumers, but as a source of goals, as problem clarifiers, and solution proposers.

(e) The SEA's function with regard to internal policy, linkage, and support includes the responsibility to assess state-wide needs and to design programs of dissemination and diffusion that allow school districts to learn about and profit from one another's activities.

(f) All the elements of the system need to be viewed as interactive.

7. Recommendations are presented for convenience under four categories:

(a) Developing a monitoring system within NIE.
(b) Strengthening the external R&D system.
(c) Building a linkage and support system.
(d) Building problem solving capacity.

In each area the elements of the NIE-directed research program are presented in terms of the nature and sequence of activities deemed necessary.

8. With regard to *monitoring the system,* the problem has centered about a lack of the data base and the understanding of systems dynamics needed for effective, rational policy making.

9. Strategies for monitoring the system rest on a concept borrowed from the literature on social indicators, but adapted to the educational scene. Present sources of data are to be used, supplemented by new sources.

10. With regard to *building the R&D system,* the problem relates to the fact that the R&D models have often been borrowed from the "hard sciences," and have not always been appropriate to the solution of complex social problems. Despite

the past decade of growth in new R&D institutions, the scientific communities in the educational field are still weak and fragmented.

11. Strategies for building the R&D system entail both long-term research and analysis and a series of special studies aimed at particular issues regarded as crucial to NIE.

12. With regard to *building the linkage and support* system, in response to a number of difficulties that beset the operating system, three initial program strategies are proposed: a consumer information strategy, an information dissemination strategy, and a product delivery strategy. Taken together, the several strategies relate to linking mechanisms designed to overcome difficulties experienced by school staff.

13. *Consumer information* has been wanting in several respects. What is needed is a program of consumer information calculated to provide better means to *identify and test* promising practices, better verification of product evaluation procedures and results, more and better *information* on product performance, and alternate strategies for providing information in an appropriate format. Strategies to achieve a more useful consumer information program through NIE efforts are directed toward more reliable information, the identification of products and practices, and experimentation with a variety of ways to effectively communicate information to interested client groups.

14. In the light of the criteria of comprehensiveness, relevance, utility, accessibility, and manageable cost, the status of *information dissemination and communication* in education is subject to improvement. The NIE Information, Dissemination and Communication Program hopes to achieve the objective of providing "timely access to all relevant and useful knowledge relating to education for the diverse members of the educational community, including teachers, administrators, school board members and other policy makers, researchers, and developers." The strategies to be employed relate to the performance in a cost-effective manner of the functions of acquisition, screening, indexing, storage, retrieval, dissemination, establishment of user services, and the development of information products. Note is taken of the fact that the Educational Resources Information Center (ERIC) is performing these functions in a considerable degree, and its services will continue while a newer, more viable system is emerging. Initial efforts, both in short-term ERIC modifications and longer-range system design will center around the scope of information covered, improved system access, and the transformation of information into usable form. Two activities intended to provide immediate improvement are a survey of user satisfactions, dissatisfactions, and information-using styles, and the identification of topics on which interpretations and distillation of knowledge are required. Other activities shortly to be initiated are an economic analysis of ERIC, user services in the form of operating information centers, and continued experimentation with on-line computer retrieval.

15. Current mechanisms for *delivering development products* to the operating system limit their accessibility, and consequently, their utilization. NIE proposes to improve education's product delivery system by increasing the understanding of the relative effects of a variety of dissemination strategies, by increasing the continuity between product development and dissemination, and by experimenting with a variety of incentives for improving the delivery of high-quality R&D products.

16. With regard to *building capacity in the operating system*, it is proposed that NIE support two major activities at the State level: to conduct knowledge production and utilization surveys and analytical studies of the role of the State department of education, and to sponsor a series of conferences to examine pertinent experiences of the several states.

With respect to problem solving in the schools, it is proposed that organizational capacity for problem solving be built at the level of the teacher, the individual school, the school district, and the school and community. The principal program elements would include surveys and analyses, three-year longitudinal case studies, the development of programs, and technical assistance and policy analysis. The elements are to be phased in over a six-year period, and are to be integrated as the program develops. At the various levels technical assistance will be provided to further the development of problem-solving responsibility within the operating system.

17. Along with the directed program for the production, dissemination, and utilization of scientific knowledge described in detail, it is the intention of the NIE to sponsor field-initiated studies in support of research on the processes of educational change.

In essence, the scope of the field-initiated studies will tend to reflect the many areas of concern expressed with regard to the directed program.

201

KNOWLEDGE UTILIZATION: SOCIAL SCIENCE

Change strategies
Change agent
Dissemination measures

COMMISSION REPORT

National Science Foundation. *Knowledge into action: Improving the Nation's use of the social sciences.* Report on the Special Commission on the Social Sciences of the National Science Board, report NSB 69-3. Washington, D.C.: U.S. Government Printing Office, 1969.

Purpose

The Commission presenting this report was charged with making recommendations for increasing the useful application of the social sciences in the solution of contemporary social problems.

Method

Although the method through which the Commission carried out its task is not described in the report, it is assumed that it was primarily analytical. A multidisciplinary group of persons served on the Commission, and the participation of other relevant persons in the preparation of the report is acknowledged.

Findings and Conclusions

1. Social scientists can contribute to solving the Nation's problems if full advantage is taken of their strengths. The following major obstacles to the utilization of social science knowledge are identified:

(a) There is frequently no institution or agency to note such knowledge and act upon it.
(b) In many instances the social sciences provide accurate descriptions or predictions of events, but no solution to the problem. This reinforces a tendency to reject that knowledge: if it provides no answers, it is irrelevant and perhaps troublesome.
(c) Social science knowledge may be rejected by some because it is threatening to their own views or to the security of their personal situations.
(d) Limited resources may be a significant factor in the rejection of social science knowledge; the solutions advanced may be valid but too demanding of those resources.

2. The expressed demand by the *professions* for social science contributions is infrequent and generally unsystematic. To strengthen and systematize this liaison, the Commission recommends that:

(a) Professional schools should include in their curricula more of the social science knowledge relevant to the particular profession. The objective is not to make social scientists of the professionals, but to assure their exposure to the methodology, capabilities, and knowledge of the social sciences relevant to that profession.
(b) Provision should be made for increasing collaborative social science-professional research efforts, not only on basic scientific questions of common interest, but also joint attacks on social problems (urban housing, juvenile courts, pollution, urban government organization, delivery of health services) within the purview of the specific professions.

3. Many of the domestic policy issues which the Federal Government is called upon to formulate and implement are more closely related to the social sciences than to the physical and biological sciences. Social sciences must be accorded their proper position as part of the entire national pool of scientific and technological knowledge and skill. To assure that the social sciences are effectively utilized by the Federal Government, the Commission recommends that:

(a) The number of social science members on the President's Science Advisory Committee should be increased to assure identification of the social science knowledge that should be available to the Committee.
(b) Professional social scientists with backgrounds in relevant areas should be added to,

and become an important part of, the Office of Science and Technology Staff.

(c) The Council of Economic Advisers should have, among its professional staff and consultants, persons drawn from relevant social sciences other than economics, and persons in the physical sciences and engineering.

(d) The present practice of employment of social scientists in the Federal Government should be strengthened and extended; periodic leaves of one academic term at full salary should be instituted to enable professional employees to bring themselves up to date with the very rapid developments of their own and related disciplines, either by means of refresher courses or by working on research of their own choosing.

(e) The Federal Government should provide for increased linkages between bodies of statistical data now routinely collected, to improve the quality, range, and utilization of social statistics.

4. There has been more resourceful use of social science knowledge by *business firms and organized labor* than by other identified groups in the national scene and the Commission urges that this association be broadened and strengthened.

5. There have been a number of successful demonstrations of the contributions of social scientists to *community organization* (as consultants; in staff or research capacities; through the interchange which takes place in workshops and conferences), but the relationship is still essentially haphazard. The Commission recommends that an evaluation be made, first, of the effectiveness of community organizations; and that then an appraisal be undertaken of the opportunities for social science to be brought to bear in community organization.

6. Improved dissemination of social science knowledge to *the public* is desirable because this knowledge is directly applicable to many aspects of the individual's own life (career planning, child rearing, voluntary community activities) and because a more receptive attitude and increased knowledge will raise the public expectations as to the value of social science in dealing with public problems. To these ends, the Commission recommends that:

(a) The National Science Foundation should increase its support of efforts to improve social science curricula in elementary and secondary schools.

(b) Social science associations and funding organizations should encourage the efforts of scholars studying how children develop an understanding of basic social science concepts; the implications of this research should be translated into redesigned curricula.

(c) New Federal efforts should be launched to develop and increase the social science component of continuing education programs.

7. To implement the foregoing recommendations and to provide sustained linkages between the social sciences and all other components in national life will call for a new kind of structure. The Commission recommends that such a structure be provided through the formation of special social problem research institutes where social problems will be analyzed by teams of specialists from the social sciences and other sciences and professions. There is need for a number of such institutes, each dealing with a specific social problem; ideally, they should be independent of university affiliation although having access to university resources and personnel. Each institute must establish close relationships with the agencies or organizations (public and private) faced with the problem it is investigating and responsible for its solution at the policy and action level, so that the implications of the institute's studies can be carried forward to the development of policy alternatives and action programs. The Commission recommends that $10 million be appropriated in fiscal year 1970 to the National Science Foundation for the establishment of such institutes; this budget should increase in subsequent years as the institutes mature; eventually approximately 25 such institutes are envisioned.

202

INNOVATION CHARACTERISTICS
Innovation: scientific
Innovation: technology

EMPIRICAL STUDY

National Science Foundation. *Science, technology, and innovation.* (Report on Contract NSF-C667.) Columbus, Ohio: Battelle Columbus Laboratories, 1973.

Purpose

The purpose of this study was to gain a better understanding of how innovation proceeds and how it is supported by science and technology. This involved documenting historically significant events in several technological innovations of high social impact. Also, the role of certain socioeconomic and managerial factors in promoting 10 separate innovations was explored.

Method

The National Science Foundation (NSF) and the project team jointly selected eight cases of technological innovations. Three were taken from project TRACES (Technology in Retrospect and Critical Events in Science, as described in a report prepared for NSF by ITT Research Institute, under Contract NSF-C535, December 1968), and five were new cases. There were two criteria for selection of the study cases: (1) that the innovations should be of high social impact, and (2) that the cases should represent diverse fields of technology and application. The historical record for each of the cases was subjected to three analyses: (1) an investigation into how certain factors affected the decisive events, (2) a search for characteristics common to the innovations, and (3) a classification in various ways of all significant events.

The eight cases studied were the heart pacemaker, hybrid grains and the Green Revolution, electrophotography, input-output economic analysis, organophosphorus insecticides, oral contraceptives, magnetic ferrites, and the video tape recorder. Hybrid grains and the Green Revolution was broken into three separate innovations: hybrid corn, hybrid small grains, and Green Revolution wheat. Therefore, a total of 10 innovations were studied.

Twenty-one factors of probable importance to the direction and rate of the innovative process were selected from the general literature. Each factor was rated for degree of importance to each decisive event for the 10 innovations. A decisive event was defined as one that provided a major and essential impetus to innovation. The 21 factors identified were: recognition of scientific opportunity, recognition of technical opportunity, recognition of the need, management venture decision, availability of funding, internal research and development management, formal market analysis, prior demonstration of technical feasibility, technological gatekeeper, technical entrepreneur, patent/license considerations, technology interest group, in-house colleagues, external direction of research and development personnel, competitive pressures, serendipity, technology confluence, general economic factors, social factors, and political factors.

Findings and Conclusions

1. *Decisive events*

In the study of decisive events, no factor was judged important for every event, yet each was of some importance to more than one of the events studied. The percentage of all decisive events for which a factor was judged moderately or highly important was calculated, and the percentages were arranged in descending order. Recognition of technical opportunity ranked first and recognition of a need for a particular innovation ranked second. Internal R&D management, management venture decision, and availability of funding ranked third, fourth, and fifth, respectively. Presence of a technical entrepreneur (an individual within the performing organization who champions a scientific or technical activity) ranked sixth, considerably higher than the twelfth-ranked technological gatekeeper (an individual who identifies scientific or technical information of relevance to the interests and activities of the researchers). These last two concepts are often discussed in the innovation literature. As the technological gatekeeper would have a more intimate and continuing relationship with the R&D team, one might expect his significance to be higher than the technical entrepreneur, but the data show otherwise. General ex-

ternal factors such as serendipity, political and social factors, and health and environment factors ranked low.

2. *Generalizations from the case histories*

Eight important characteristics frequently observed and reported in previous investigations of the innovative process were identified, and the 10 cases were studied with respect to these characteristics. The characteristics were: early recognition of need, independent inventor, technical entrepreneur, external invention, government financing, informal transfer of knowledge, supporting inventions, and unplanned confluence of technology.

The importance of the technical entrepreneur was highlighted in nine of the 10 innovations. As the entrepreneur also was shown to be an important factor in the study of decisive events discussed earlier, an important conclusion of this study is that the technical entrepreneur plays a significant role in the successful implementation of an innovation.

Early recognition of need for an innovation appeared in nine of the cases and confirmed the high ranking of the corresponding factor in the study of decisive events.

Adequate funding also emerged as an important aspect for both analyses.

In six of the innovations, unplanned confluence of technology proved important. Confluence of technology was present for the other four innovations, although it was the result of deliberate planning rather than accident. Technology confluence ranks near the middle as a factor influencing decisive events. The indication is that the benefits of technology of confluence should not be left to accident but should be promoted through deliberate interdisciplinary research.

3. *Analysis and classification of the significant events*

From the 10 innovations, 533 significant events were identified. A significant event is defined as an occurrence judged to encapsulate an important activity in the history of an innovation. These were classified into four types: nonmission-oriented research (NMOR), mission-oriented research (MOR), development, and nontechnical events.

It was found that, among the 10 innovations, the time span from first conception of an innovation to its first realization is not growing shorter. The time span averages about 19 years and ranges from six to 32 years for the 10 innovations studied.

In the preconception and innovative periods, MOR and development events became more dominant as time progressed, although NMOR events were found up to and beyond the date of first realization. Such late NMOR events usually represent a process of feedback and diffusion from technology to science.

4. *Can innovation be managed?*

As it was found that NMOR events continue to occur up to the end of the innovative process, the conclusion is drawn that innovation cannot be completely controlled or programmed. Also, the actions of the technical entrepreneur, or the role of such motivational forces as recognition of need and recognition of technical opportunity, involve inventive or creative activities that do not lend themselves to detailed planning.

Therefore, management can promote innovation by permitting and encouraging the opportunity to act upon ideas that fall outside the established or recognized pattern. Funding and confluence of technology also have been shown to be important factors. Management could further aid the innovative process by providing secure funding and promoting interdisciplinary R&D teams.

203

CHANGE PROCESS
Innovation characteristics
Innovation factors
Innovation: social

EMPIRICAL STUDY

Niehoff, A. H. The process of innovation. In A. H. Niehoff (Ed.), *Handbook of social change.* Chicago: Aldine, 1966, chapter 2.

Purpose

In this chapter, the author abstracts principles and factors affecting kind and rate of change. He provides an analysis of socioculture change through time.

Method

This book is based on samples of innovative programs in underdeveloped countries around the world.

Findings and Conclusions

1. Characteristics of the innovator (change agent) which affect change:

(a) *Personality*—he must have empathy and the ability to establish rapport.
(b) *Knowledge of local language*—he needs to know the language and the nature of the subculture.
(c) *Technical competence*—it is less important what kind of reputation the change agent has in his own culture than what kind of image he creates in the local community.
(d) *Affiliations*—he needs to be aware of the effect of his affiliations and either emphasize or deemphasize them as conditions may require.

2. Factors related to the innovator's method of communication:

(a) The most effective method of communication is that which makes use of demonstration, personal contact, and feedback from recipients.
(b) Formal communication efforts are probably the most inefficient ways to transfer knowledge.
(c) Audiovisual techniques, including mass media communication, are hindered in their usefulness because of impersonality and lack of feedback opportunity.

3. Factors related to the nature of the participation of recipients:

(a) *Passive compliance toward change,* or the simple lack of opposition, is a very weak base on which to build a change project.
(b) *Utilization of the local culture*—the culture, however old and inefficient particular practices may be, is a system that does work and provides the members with a predictable future. People will not willingly give up their practices until they are well convinced that the new ones are really improvements. The strategy of the replacement method has much less promise than the adaptation method.

4. The change agent's behavior with regard to timing and follow-up:

(a) *Timing*—the introduction of an idea should be made at an opportune time in relation to special circumstances or events.
(b) *Flexibility*—the change agent must be willing to alter his original plans to compensate for unforseen difficulties. To insist that the goal remain as initially planned is to risk having the entire project rejected.
(c) *Continuity*—the change agent must engage in consistent follow-through of a plan in a general manner, even if it is altered in its details to fit local circumstances that were not foreseen at the outset. The most important element of this strategy is that the actions of the change agent be predictable from the point of view of the recipients.
(d) *Maintenance*—the change agent must establish a pattern of maintenance. If a project does get near a successful conclusion, the single most important factor which may mean the difference between integration and abandonment is whether or not a pattern of maintenance has been established.

5. Primary variables related to the reaction of the recipients:

(a) *Whether they have an initial felt need*—any project based on a felt need has a strong motivational base on which to build. If it is lacking, the need will have to be generated, which is usually a difficult task. Three types of felt need are:
  (1) *Solicited*—a need for which the recipients are fully aware to the extent that they solicit assistance from the change agent.
  (2) *Demonstrated*—a need of which the recipients have demonstrated their interest to the extent that they have tried to solve their problem by their own efforts without outside assistance.
  (3) *Ascertained*—a need which, although already existing when the change agent arrives, is only latent within the local social group and must be ascertained by both the innovator and the recipient.

(b) *Whether they perceive any practical benefit* in adopting a change. A practical benefit motivation is a sound basis on which to build only if it is perceived as such by recipients. Other effective motivators are:
  (1) *Competition*—gives perceived status advantage to the individual or group.
  (2) *Reward and punishment*—a reward to induce the recipients to accept a new idea or course of pressure to induce compliance.
  (3) *Novelty*—includes interest generated for a new idea because it is novel or impressive, a weak motivation.

(c) *Whether their traditional leaders are brought into the planning and implementation process*—the most important characteristic of a local society is its leadership. There is probably no way to ruin the chances for an innovation project more easily than to ignore the traditional leaders or to choose the wrong ones.

204

KNOWLEDGE DISSEMINATION
Information uses by scientists

REVIEW OF LITERATURE

Paisley, William J. Information needs and uses. In C. A. Cuadra (Ed.), *Annual review of information science and technology*, vol. 3. New York: Interscience, 1968, pp. 1-30.

Purpose

This chapter undertakes a systematic review of recent research in the area of information gathering and dissemination behavior of scientists and technologists. The author expresses a concern about shallow conceptualization in the field, and implies a failure to consider the following factors:

1. The full array of information sources that are available.

2. The uses to which information will be put.

3. The background, motivation, professional orientation, and other individual characteristics of the user.

4. The social, political, economic, and other systems that powerfully affect the user and his work.

5. The consequences of information use—e.g., productivity.

Method

The findings of studies on information needs and uses reported during 1967 are interpreted within the context of the idea that the scientist/technologist stands at the center of many systems that touch every aspect of his work. Paisley identifes 10 interrelated systems affecting the scientist and his relationship to information: (1) the scientist within his culture; (2) the scientist within a political system; (3) the scientist within a membership group; (4) the scientist within a reference group; (5) the scientist within an invisible college; (6) the scientist within a formal organization; (7) a work team; (8) his own head; (9) a legal/economic system; and (10) a formal information system.

Findings and Conclusions

The main points which are pertinent to research utilization are:

1. Information "acceptances" are significantly related to the perceived technical quality of a channel but not to accessibility or ease of use, according to a study of engineers by Allen and Gerstberger. Thus, engineers *use* information channels in proportion to accessibility and ease of use, but they *accept* ideas in proportion to the technical quality of the channels.

2. Maximum benefit may come from relatively small units of information, transferred rapidly and unerringly to those who, at a given moment, need them.

3. Several studies show that the work team is the most significant information source for the technologist. Scientists (researchers) lean more heavily on literature sources, while technologists (practitioners) depend on oral sources.

4. Within the engineering laboratory are found technological "gatekeepers," who are more in touch with outside developments and with the literature than are their co-workers, and who allow the effective entry of information into the organization and assist its dissemination with the organization.

5. Judgment as to the success of an innovation should be withheld until the innovation has time to "settle."

205

KNOWLEDGE UTILIZATION
Communication process
Dissemination factors

ANALYTICAL MODEL

Paisley, W. J. Perspectives on the utilization of knowledge. Paper presented at the meeting of the American Educational Research Association, Los Angeles, February 1969.

Purpose

1. To stress the growth in quantity of knowledge being produced and the necessity of getting it to the user quickly.

2. To outline perspectives which help us understand what happens in knowledge utilization. Paisley discusses (a) messages and (b) channels of knowledge.

3. To outline systems that affect knowledge utilization, including how one person can function as a knowledge producer, a middleman, and a user taking on each role at different times, depending on the knowledge system in effect.

4. To outline 10 phases of message acceptance. Paisley extends a previous notion of the phases of adoption.

Method

The author discusses concepts from the field of knowledge utilization research, presents systems that impinge on knowledge utilization procedures, and distinguishes steps in the adoption process.

Findings and Conclusions

1. *Growth of knowledge and need for quicker dissemination.* Our age has witnessed a tremendous growth in knowledge production. But much knowledge acquired through scientific research does not reach people who need it in time. There are barriers to effective delivery of knowledge, chief among them the assumption that "while knowledge production needs to be force-fed, knowledge utilization will somehow take care of itself."

2. *Perspectives on knowledge utilization.* The author describes concepts from the field of knowledge utilization research, which give an idea of "what happens, and fails to happen" to knowledge once it is produced.

(a) *Messages.* Messages may be characterized by: content, function, permanence, comprehensiveness, and surprise value (novelty). Novelty characterizes information, and knowledge is a subset of information. Messages inform, motivate, and facilitate.

(b) *Channels.* Paisley distinguishes between horizontal and vertical flow of scientific information and specialized knowledge in general. Horizontal flow takes place at the same level, as betwen fellow experts. Vertical flow involves knowledge utilization at another, usually lower, level of expertise. Public

health and education are unique in having deep, stratified audiences for information (i.e., different kinds of experts at many levels). Some channels of information serve certain message functions better than others. The motivation function, for instance, may be lost when an impersonal channel is chosen instead of a personal one.

3. *Knowledge procedures, middlemen, audiences, and systems.* One person can be a knowledge producer, a middleman, and a user; he takes on each role at different times. The knowledge system in which he participates is affected by other systems, e.g.:

(a) The *Culture* provides traditions and values as part of the knowledge system's environment.
(b) The *Political System* has three important effects. First, scientific nationalism may cause us to ignore foreign research. Second, the money coming from Washington may be deemed as "under the system of scientific federalism." Third, Defense Department funding causes security restrictions on information flow, and may cause moral qualms in the scientific community.
(c) *Membership group* influences the scientist's choices, and commands some loyalty. This group exercises great influence over official channels of information.
(d) *Reference group*, or the group with which a person identifies, commands great loyalty and may control a journal or two in which the scientist might want to publish.
(e) The *"Invisible College"* links elite researchers and gives them support, information, and often political privilege.
(f) *Formal organization* either facilitates or blocks the flow of information.
(g) The *Work Team* is a rich source of informally conveyed information.
(h) The *Researcher's Own Head* encompasses its own unique system of motivation, intelligence, creativity, and cognitive structure.
(i) The *Legal/Economic System* influences the quantity and quality of information in circulation. This system's influence is visible in the operation of patent laws or in the economy's influence on research funding.
(j) The *Formal Information System* provides a market place for information.

4. *Stages of message acceptance.* Paisley distinguishes 10 phases a message goes through:

(a) *Awareness.* The receiver perceives that a message is being sent.
(b) *Attention.* The receiver tunes in to the message.
(c) *Exposure.* The message is transferred via sense organs to the receiver.
(d) *Comprehension.* In this cognitive phase, the receiver learns what is being communicated.
(e) *Retention.* The message is kept—or lost—in competition with other messages.
(f) *Motivation.* A potential for acceptance exists; motivation determines whether it will occur or not.
(g) *Pretrial evaluation.* The receiver examines the new information and judges whether he will use it or not.
(h) *Trial.* The receiver tries the new idea, tentatively.
(i) *Posttrial evaluation.* The receiver evaluates the results of the trial of the new idea.
(j) *Complete adoption.* The receiver decides to adopt the idea and uses it.

206

INFORMATION NEEDS
Dissemination: education
Communication media

EMPIRICAL STUDY

Paisley, William, et al. *Developing a sensing network for information needs in education.* Stanford, Calif.: Institute for Communication Research, Stanford University, 1972.

Purpose

To present the findings of a project undertaken to test the convergent validity of five alternative methods of assessing educators' information needs; to provide 1972 baseline data on the nature of educators' information needs, distinguishing between information needs which bear upon: (a) educational process, (b) educational content, (c) human variables.

Method

Five procedures were employed to gather data.

1. Thirteen state surveys were conducted in which questionnaires were distributed to personnel in selected school districts and state education agencies.
2. A "follow-up" investigation was performed in which educators who had requested information from central and local information centers were surveyed by means of questionnaires.
3. An "information specialists" study was conducted in which the expert personnel of ERIC clearinghouses and local information centers attempted to project the information needs of their clients.
4. A "hotline" study was performed in which educators across the country were invited to call a toll-free long distance number to request information. These requests were fulfilled and the topics of these were simultaneously recorded as data.
5. An "educational serials topic trends" study was performed in which the periodical literature of the field of education was monitored at four time points so as to detect changes in topic preference rankings.

Findings and Conclusions

An analysis of the convergent validity of the five methods employed was conducted. The analysis showed that the five studies or alternative data collection methods formed two groups within the convergent validity matrix. One group is composed of the state surveys, the query follow-up study, and the information specialists study. Agreement between the results of these studies as to frequency and content of information needs is high. The second group is composed of the two hotline studies and the four educational serials studies. Agreement among the results obtained from these studies is weaker but, like the first group, is highly correlated with regard to (a) reflected nature of information needs across methods of data collection, (b) respondent characteristics, i.e., educators' position (teacher, principal, counselor, etc.) and educators' level of activity (elementary, secondary, or non-school personnel).

207

KNOWLEDGE DISSEMINATION: SCIENCE

Communication media
Diffusion process

ANALYSIS AND SUGGESTIONS

Parker, E. B., and Paisley, W. J. Research for psychologists at the interface of the scientist and his information system. *American Psychologist,* 1966, 21, 1060-1071.

Purpose

To note the importance of informal information networks in the dissemination of scientific information.

Method

Investigations are referred to in the authors' analysis of the subject.

Findings and Conclusions

1. Applied research workers depend heavily on informal information networks; that is, interpersonal systems, "accidental" acquisition of useful information, "inefficient" and "irrational" information seeking, etc. This is more true of those whose jobs rest on completed rather than continued training.

2. "Pure" scientists were found to be literature dependent, whereas "applied" scientists were "colleague dependent" for information. This finding applied particularly to medical scientists.

3. Accidental discovery of information in rich environments, with many dissimilar colleagues, unrestricted long-distance telephoning and travel is especially fruitful to applied scientists.

4. The authors suggest that theories of information use are needed, and that more data should be collected through such methods as questionnaires, observation, and sociometric analysis as a basis for developing such theories.

208

RESEARCH UTILIZATION: EDUCATION

Utilization barriers

ANALYSIS

Pellegrin, Roland J. The place of research in planned change. In R. O. Carlson, et al., *Change processes in the public schools.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1965, pp. 65-75.

Purpose

Pressures for change bring to the fore serious and complex problems concerning: (1) the nature of the changes that should be introduced, (2) the method, and (3) the timing of innovation introduction. In this article the author discusses the need for reliable research as a basis for planned change in education. He outlines the obstacles to sound educational research, as well as defining the characteristics of reliable educational research.

Method

The ideas in this article are based on the broad experience and observations of the author.

Findings and Conclusions

1. Educational decision makers rely heavily on authority to justify existing policies and practice. Intuition and common sense seem to be the major springboards for innovation. Pellegrin alleges that

much effort is expended on attempts to achieve goals that are identified through a chain of assumptions resting on a questionable base.

2. There are several obstacles to overcome before educational research can provide reliable knowledge upon which policy, practice, and innovation in education can rest. These obstacles include:

(a) There is a widespread lack of appreciation for and understanding of the nature and value of research. Teachers and administrators rely on precedent and common sense much more than they do on research findings. Thus a vicious circle exists: "(1) Many educators do not conceive of the scientific method and research as being of primary significance to their work; (2) this state of mind creates an atmosphere in which low priority is given to the conduct or utilization of research; (3) because of low evaluation and neglect, research continues to be a dubious enterprise; and (4) because condition (3) exists, (1) is perpetuated."
(b) Much existing research is low in quality, weak in the insight it imparts, and of dubious utility to the practitioner.
(c) The nature and functions of "theory" are poorly understood. For many practitioners, the term is a synonym for "wild speculation," and an antonym for "practicality."
(d) There is considerable confusion about the relationship between empirical fact and values. There is a failure to realize that reliable knowledge can be used to make intelligent value choices possible.
(e) Research on topics important to education covers a wide range. These topics are often complex and difficult to investigate.

3. In citing the contributions that research *can* make, the author makes these points: "Research can provide us with new knowledge as well as test existing knowledge. It can hold our present assumptions up for scrutiny, giving us evidence concerning their truth or falsity. Research can be used to evaluate policies and practices. It can also be made an integral part of our experimental programs."

4. The author feels that in order for educational research to be reliable enough to be used as a basis for practice, it must be either: (a) the testing of well-defined but isolated hypotheses, or (b) research directed by systematic and integrated theory.

> We must not only train substantial numbers of researchers and disseminate research findings widely, but we have an even larger task, that of developing a respect for and sympathetic attitude toward research throughout the armies of educational practitioners. Otherwise, research will be of limited effectiveness. . . . The development of a scientific perspective and a research orientation is the most urgent and important challenge facing those who are responsible for training programs at all levels.

209

INNOVATION: EDUCATION
Adoption factors
Innovation: bureaucracy

ANALYSIS AND SUGGESTIONS

Pincus, J. Incentives for innovation in the public schools. *Review of Educational Research,* 1974, 44, 113-144.

Purpose

To discuss the structure and incentive systems of public schools as they relate to (a) the adoption of innovation, and (b) the implementation of innovations in the schools; to detail various aspects of the influence of bureaucracy and market structure on the educational system; to discuss the implications therein for educational research and development.

Method

According to the author, the propositions in this paper "are not based on careful testing of hypo-

theses, but on a blend of evidence and speculation, and are aimed at influencing how we might think about educational R&D policy."

Findings and Conclusions

1. *The institutional setting.* For most people, the local public school is the only school available; that is, the school has a monopoly on schooling services in the area. The author cites five differences between the school's monopoly and those of public utilities:

(a) Quality of school service may vary within a district, creating issues of equity along income, race, and neighborhood lines;
(b) consensus varies concerning what priority should be given to the various aims of schools;
(c) the technology of schooling is unclear;
(d) school districts may have very little incentive to be competitive, i.e., to increase their registration at the expense of other districts; and,
(e) though they are educational institutions, schools provide only a portion of the student's educational resources.

Schools share a number of common characteristics with other nonmarket public utilities. They are self-perpetuating bureaucracies. They cannot select their clients and the clients must, for the most part, accept their services. School districts are part of a decentralized but highly complex system. And the schools are "a labor-intensive craft industry."

2. *Consequences for dissemination of innovations.* The author makes six comparisons between the public schools and a competitive firm. The schools would:

(a) be more likely to adopt cost-raising innovations,
(b) be less likely to adopt cost-reducing innovations,
(c) be less likely to adopt innovations that significantly change the resource mix,
(d) be more likely to adopt new processes or management techniques that do not significantly change the institutional structure,
(e) be less likely to adopt innovations that change the accustomed authority roles, and
(f) be as unwilling as competitive firms to face large-scale encroachments on protected markets.

According to the author, private firms are more likely to adopt innovations that promote economic efficiency, whereas schools are more likely to adopt innovations that promote bureaucratic and social stability.

Bureaucratic factors support innovations having to do with (a) bureaucratic safety, (b) response to external pressure, and (c) approval of peer elites. These three factors interrelate. In combination with the market structure of the "industry," according to the author, schools tend to use innovations to enhance their self-images. But they resist thoroughgoing change.

3. *From innovation to implementation.* Often innovations are not implemented according to the directives of their developers. Pincus gives four reasons: (a) R&D organizations frequently do not provide sufficient guidance, (b) teachers, administrators, and students refuse to change their behavior patterns, (c) the schools may not know how to implement the innovation, and (d) school personnel may be more interested in the rhetoric of change than in the practice of change.

Schools are often hard-pressed for funds; system maintenance is a realistic concern. Pincus cites a number of attributes of the federal aid system which discourage innovation in school systems:

(a) There is a tendency to subsidize educational R&D without particular reference to effects of the developments on various outcomes of schooling;
(b) some evaluation reports are ignored (others are not worth heeding);
(c) changes in program priorities are too frequent to allow for sufficiently long educational experiments;
(d) state and federal agencies tend to contribute seed money for projects but do not supply funds for continued implementation;
(e) school districts do not see clear government policies towards innovation;
(f) federal aid is seen as unreliable and therefore cannot be used for long-term change; and
(g) the federal government's support for innovation is relatively small scale compared to other programs.

4. *Implications for educational R&D.* In view of the preceding discussion, the author suggests five broad emphases for R&D policy in encouraging adoption of educational innovations:

(a) Large-scale experimentation;
(b) collaboration between R&D agencies and educational leadership networks;
(c) case studies of successful and unsuccessful innovation;

(d) research that will improve the R&D community's understanding of the existing pattern of incentives in the schools; and
(e) trying out methods of restructuring system incentives.

In the last category, Pincus suggests: (i) changes in market structure, (ii) changes in the locus of control, (iii) changes in individual incentives, and (iv) clearer standards for accountability and better information systems.

210

RESEARCHER-PRACTITIONER RELATIONSHIPS

Research utilization: mental health
Utilization measures

CASE STUDY

Poser, E. G., Dunn, I., and Smith, R. M. Resolving conflicts between clinical and research teams. *Mental Hospitals*, 1964, 15(5), 278-282.

Purpose

Shortage of available funds is not the only reason that research in psychiatry and clinical psychology has lagged behind research in other branches of medicine. In mental hospitals, administrative and therapeutic considerations limit research at least as often and as severely as insufficient funds. The authors set out to discuss some procedural roadblocks to mental hospital research and some remedies.

Method

The ideas expressed in this article are based on the experiences of the authors in conducting a research project at the Verdun Protestant Hospital.

The purpose of the research study was to evaluate the outcome of group therapy with regressed schizophrenic patients. The research aimed to compare the outcome of group therapy by trained and untrained therapists.

Findings and Conclusions

1. A major source of difficulty in doing research in a mental hospital setting is conflicts between the needs of the researchers and the aims of the clinicians. The clinician often fails to appreciate that the research worker has as deep and imperative a commitment as his own, and the commitments of the two are often antithetical.

2. The first conflict of interest arose when it was necessary to eliminate all group therapy experiences of test patients except for the research-related sessions. The conflict was intensified when the researcher requested that a number of patients from each ward should be considered control cases and should not receive any group therapy whatever. "To the therapeutically oriented staff members, this seemed to border on cruelty."

3. Resistance to the temporary reduction of services was further intensified by the fact that ongoing group activity program was a recent development in which many of the staff were involved. In fact, it was the most recent of a number of efforts to mobilize regressed patients. Successful results were just beginning to emerge.

4. Resolution of the conflict came through extensive interpretation by the researchers of the validity of the research needs and the potential long-range gain the research would provide to the clinicians.

5. Final resolution of this conflict came only after the researchers recognized and expressed recognition of the successfulness of the existing practice and pointed out how the results of the research would lead to more widespread use of the successful practice.

6. Continuous interpersonal communication between the research and clinical teams was essential to the overcoming of resistances to the research. Increased recognition of the role of each team by the other was the major factor in overcoming resistance.

7. Motivational problems occurred in both staff members and patient participants throughout the course of the study.

(a) Staff resentment to a research project is rarely expressed directly, but takes the form of subtle noncooperation or sabotage.

(b) This difficulty was dealt with by having regular meetings with all the ward personnel, during which the clinical supervisors and the research directors openly discussed the organizational problems that had arisen and asked everybody for help in solving them. During these sessions the entire staff was told how the project was going and this frequently led to spontaneous comments about one or another patient having shown considerable improvement in his ward behavior. Comments of this kind contributed more than anything else to the resolution of conflicts generated by the project.

211

RESISTANCE TO CHANGE
Resistance reduction
Change in attitudes

ANALYSIS AND SUGGESTIONS

Reddin, W. J. How to change things. *Executive*, June 1969, 22-26.

Purpose

To set forth suggestions for overcoming resistance to change.

Method

The author presents a speculative analysis of the subject.

Findings and Conclusions

In order to change things, resistance to change must be overcome. There are seven techniques by which this may be accomplished: diagnosis, setting of mutual objectives, group emphasis, maximum information, discussion of implementation, use of ceremony or ritual, and resistance interpretation.

1. The process of making a *diagnosis* leads to an increased awareness of what is wrong, which in turn can lead to steps to change the situation.

2. Much resistance is based on a misunderstanding or disagreement about objectives; resistance is reduced when *objectives are mutually set* by those likely to be affected by a change.

3. Resistance to a change is reduced if the group rather than the individual is made to focus on it, group decision having a powerful control over the deviant member.

4. Once a change is seriously contemplated or announced, the *maximum possible information* about it should be distributed. Because of recognition of possible resistance at each stage, appropriate announcements should be made indicating: (a) that a decision to change has been made; (b) what the decision is and why made; (c) how the decision will be implemented; and (d) how the implementation is progressing.

5. Resistance to change can be reduced if there can be agreement on the rate and method of implementation.

6. When there are clearly established progressions from one role to another (marked by ceremony or ritual), change becomes much easier to accept.

7. When people understand why they have been resisting a change, the resistance usually decreases, or at least becomes more rational.

212

ORGANIZATIONAL CHANGE
Change process: social

CASE STUDY

Rein, Martin. Organization for social change. *Social Work*, April 1964, 9, 32-39.

Purpose

To examine the kind of internal structure that permits a social welfare organization to carry out a controversial (innovative) function, to pursue these goals vigorously, and to obtain the resources (money, clients, and personnel) which are necessary for the effective achievement of its goals.

Method

The study was carried out through an analysis of affiliates of the national Planned Parenthood Federation. The study consisted of: (1) a historical survey of the development of the national organization; (2) ratings of the relative effectiveness of affiliates by a panel drawn from personnel at PP, correlated with a number of internal variables (money, clients, personnel) and external variables (community acceptance or opposition); (3) case studies of four affiliates, two judged effective and two ineffective by a national rating committee.

Findings and Conclusions

1. Planned parenthood follows a locality-responsive style for the achievement of its designated goals; it has a structure and style of operating which are responsive to the needs, demands, and values of the community of local agencies in which it functions.

2. Among the affiliates studied, community acceptance (or opposition) and interagency cooperation were not relevant factors in contributing to the affiliates' possession of resources, nor to their overall effectiveness.

3. Local boards were nonetheless committed to gaining community acceptance and interagency cooperation; this produced fear, resentment, and conflict for other community agencies, and created embarrassment and conflict of loyalty for PP board members who were also active on their boards in the local community.

4. It is concluded that PP's locality-responsive style is not congruent with the controversial goals it pursues.

5. It is suggested that those organizations operating in the context of controversial problem areas, which are most capable of assertive pursuit of their goals do not follow a locality-responsive style; that they not be federated, locally based, nor committed to a strategy of cooperation. A locality-independent style is more congruent for controversial organizations.

213

CHANGE PROCESS: SOCIAL
Change strategies

CASE ANALYSIS

Rein, M., and Miller, S. M. Social action on the installment plan. *Trans-action*, 1966, 3(2), 31-38.

Purpose

The authors undertake a critical evaluation of demonstration research as an instrument of social change; they assess the strengths and weaknesses of the demonstration project and advance strategies which might improve the efficacy of the demonstration project as an agent of change.

Method

The paper is based on analysis, augmented by considerable case material.

Findings and Conclusions

1. Although the assumption underlying demonstration projects is that they are a way to get action, they often postpone change rather than facilitate it. Relatively little money is spent, relatively few people are affected, the real problem is hardly touched, public sense of urgency is deflected, and there is a good chance that by the time the demonstration is finished, public interest will have drifted.

2. The demonstration project has a number of assets: It is fashionable, politically attractive, rationally appealing, inexpensive, and not binding.

3. Such projects also have their liabilities: they may produce unequal distribution of money and resources; they distract from national policy (emphasizing local orientation); they overemphasize success and tend to disregard or play down failure.

4. Before success on a small scale (that is, via a demonstration project) can become a means for change in major institutions, these crucial questions must be raised:

(a) *What kind of influence do the promoters of the demonstration intend to have?*
   (1) Do they want their project duplicated exactly elsewhere as needed? (*Spread*)
   (2) Is the purpose of the demonstration simply to attract attention to a problem, to show that something must be done about it? Is the demonstration to serve as a catalyst rather than a model? (*Spillover*)
   (3) Do the promoters want the original model continued on a more permanent basis? (*Continuity*) If so, an approach for assuring continuity may involve:
      - Participation by a powerful and influential local board.
      - Financial participation through matching funds.
      - The power of knowledge . . . the firm conviction that the results will be so definite, so clear-cut and dramatic that organizations will be impelled to find the opportunity to apply the innovations on a large scale. The authors contend that this power is largely mythical because "present-day research methodology is simply inadequate for evaluating comprehensive demonstration programs, which are subject to the vagaries of political expediency."

(b) *Whom do the promoters hope to influence?* The target group must be realistically identified—Is it national? Local? Can diverse targets be satisfied simultaneously? Do the promoters of the project understand the value systems of those they are attempting to influence?

(c) *How will influence be exerted?*
   (1) *Infiltration from within*—sometimes a small demonstration is set up inside an established institution in the hope that the larger unit will eventually adopt the innovation of the smaller. (However, the risks of sabotage are considerable.)
   (2) *Duplication from without*—a parallel institution is established that duplicates some or all of the functions of an existing (and change-resistant) institution, doing them better, in the hope that the established institution will modify its operation accordingly. (Duplication is costly, of course.)
   (3) *Pressures from without*—citizen groups can be organized to put pressure on local officials as a means of getting action toward implementing demonstration findings. (This sometimes promotes inflexibility, closes off alternate courses of action.)

4. The following suggestions are offered to improve the position of demonstration projects as agents of change.

(a) Funders should insist that the demonstration be relevant to the social problem involved and that the staff be clear on questions of social policy.
(b) Greater clarity of purpose should be pursued.
(c) The funders must stay with the projects, not quit when the going gets rough.
(d) The funders must be more concerned with getting and maintaining quality.
(e) New methods of reporting and accountability are needed.
(f) A program cannot promise (or deliver) everything; it must make choices.
(g) Adaptation must be built into the design of all demonstrations.
(h) Demonstration staffs must be prepared for conflict, and must learn to live with it.
(i) Research should be relevant to all social needs; each project must be part of an overall pattern.

214

ORGANIZATIONAL CHANGE
Innovation: industrial
Organizational climate

EXPERIMENTAL STUDY

Rice, A. K. Productivity and social organization in an Indian weaving shed: An examination of some aspects of the sociotechnical system of an experimental automatic loom shed. In H. A. Hornstein, B. B. Bunker, W. W. Burke, M. Gines, and R. J. Lewicki (Eds.), *Social Intervention: A behavioral science approach.* New York: The Free Press, 1971.

Purpose

This paper describes a preliminary analysis of the sociotechnical system of an experimental automatic loom shed (weaving cotton cloth) on the basis of which the methods of working were reorganized and an increase in productivity achieved. The analysis was made by the Tavistock Institute in the Ahmedabad Manufacturing and Calico Printing Company Limited in Ahmedabad, India.

Method

Experimental case study: After a description and analysis of loom shop operations, reorganization of work methods for a 68-loom group was planned and implemented, followed by a report of the results.

Findings and Conclusions

1. The automatic loom shed is described as follows:

(a) The shed contained 224 looms manned by 29 workers, of whom 28 were concerned directly with the manufacture of cloth and one with artificial humidification.
(b) The activities of a single loom were cyclic—load, weave, unload—and required successive performance of tasks to carry them out. The activities of a loom shed containing a number of looms were continuous and required the simultaneous performance of tasks to maintain the continuity.
(c) The weaving process consisted of component tasks and the number of workers allocated to different tasks had been determined by work-studies of the separate components.
(d) The looms in the shed were differentiated into 19 different loom groups of five kinds which overlapped in different degrees. Each kind of loom group contained a different number of looms—groups which were manned by a different number of workers.

2. The sociotechnical system of the loom shed involved the following features:

(a) All tasks of the manufacturing were interdependent, but the workers performing them worked in different kinds of loom groups and had, therefore, different degrees of interdependence. Some were virtually independent of each other.
(b) The resultant pattern was an aggregate of individuals with confused task and worker relationships and with no discernible internal group structure.
(c) Change of sort (kind of cloth woven) led to a restructuring of some kinds of loom groups and in consequence to a change in the pattern of relationships.
(d) Higher management had provided reinforcement for the governing system of the shed. This, and the high quality of the relationships between supervisors, and between supervisors and workers, had prevented any overt difficulties resulting from the lack of group structure; but efficiency in the shed was lower and damage was higher than target figures.
(e) In spite of the persistence of "weaver" as a title for an occupational role, the weaver was the loom, and all workers, including the "weavers," serviced the machines. The tasks performed were found to be differentiated into two main groups: those concerned with short loom stops (after a simple yarn break) and those concerned with long loom stops (for loading and unloading, maintenance, etc.). During shift hours two worker subgroupings appeared possible—the short-stop subgroup and the long-stop subgroup.
(f) An analysis of changes in the numbers of workers with change of sort showed that relatively stable numbers could be obtained for each of three main groups of sorts—

coarse, medium, and fine—and that each provided some tasks which could be considered interchangeable. No changes in worker groups would be required for changes within the main sort. The theoretical numbers required for blocks of sixty-four looms, into which the loom shed was divided by physical boundaries, were calculated.

(g) Three natural grades within a worker group for 64 looms were found. They were designated by letters only; pay rates slightly in excess of existing rates were fixed for these grades, and it was decided to pay piece rates to the whole group.

(h) It was decided by higher management to discuss with mill and shed management and the workers the organization of one experimental work group for a group of 64 looms.

(i) Shed supervisors and workers spontaneously took possession of the reorganization, and the workers themselves immediately organized four experimental groups. Higher management took no part in the discussions with supervisors and workers and permitted the experimental groups so chosen to start work.

3. The experiment resulted in the following:

(a) The creation of internally structured and internally led small work groups.

(b) A reduction in the number of those reporting directly to the supervisors and a consequent strengthening of the executive command.

(c) The beginning of the withdrawal of higher management from the governing system of the shed.

(d) The abandoning of old occupational titles, although new titles were not chosen. Five months afterwards, both tasks and roles were still known by the letters designating the grades.

(e) After an immediate increase in mean efficiency in the experimental groups at the cost of increased damage and inadequate maintenance, a settling down at a new level of performance in which efficiency was higher and damage lower than before reorganization.

(f) These results could not, in the time available, be related to the general ecological background of economic, industrial, or cultural conditions of India. Language difficulties barred obtaining the feelings of workers. The evidence for the appropriateness of the procedure was the spontaneous acceptance, implementation, and continuation by the workers, and the withdrawal from the governing system of the shed by higher management.

(g) No adequate information was available of repercussions in the rest of the mill.

(h) Although the analysis has not been completely followed through, it seems fair to conclude that the findings reported had a direct relationship to the event of reorganization.

215

INNOVATION DIFFUSION

Innovation measures

Diffusion: traveling seminar

CASE STUDY

Richland, Malcolm. *Traveling seminar and conference for the implementation of educational innovations.* Santa Monica, Calif.: System Development Corp., 1965. (Technical memorandum series 2691.)

Purpose

The purpose of the project was to determine whether traveling seminars and the use of outside change agents were effective techniques for shortening the gap between innovation and practice in education.

Method

Four groups of approximately 30 educators each, representing four regions of the United States, constituted the traveling seminar. They visited selected schools where significant innovations had been introduced and had been in operation for at least

one year. Each tour was led by a well-known and respected educator (outside change agent) who was accepted by his professional colleagues as being especially qualified to interpret the experimental foundations upon which a particular innovation was based. Immediately following the seminar, a conference of tour participants was conducted at System Development Corp. on the dynamics of educational change. The evaluative phase of the study was carried out approximately one year later through on-site visitations to the participant's own schools. An attempt was made to assess the behavioral effects of the traveling seminar and conference upon the participants. The analysis was accomplished by collecting data on innovational behavior and attitudes toward innovation from the tour participants and an equal number of school personnel (control group) who did not visit innovational schools.

Findings and Conclusions

1. The traveling seminar and conference is a highly effective dissemination method for stimulating and facilitating educational innovation. Participating school districts were demonstrated to be more innovative in actual practice and to register more innovative attitudes.

2. There are measurable attributes of school districts related to the innovational behavior of these districts. There was a significant correlation between innovational behavior and the following variables: urbanity, population density, percentage of Jews, social class, high school density, high teacher salary.

3. The attitude of the local superintendent of schools toward innovation is a significant variable in the introduction of innovations in school districts.

4. It was recommended that the traveling seminar and conference technique be expanded and a number of specific suggestions were advanced for refining and improving the technique.

216

CHANGE AGENT
Research utilization

CONFERENCE REPORT

Riley, P., Hooker, S., and Masar, N. Introducing RUS: A link between research and service. *Rehabilitation Record*, November-December 1968, 22-24.

Purpose

This article introduces a new concept to the field of rehabilitation—the Research Utilization Specialist (RUS), to act as a change agent.

Method

This is a summary of a report on two conferences, in 1966 and 1968, sponsored by the University of Florida at Gainesville.

Findings and Conclusions

1. Two recent moves to close the gap that still exists between research and practice were the appointment of a Research Utilization Task Force by the VRA Commissioner in the fall of 1966 and the establishment in 1967 of a Research Utilization Branch within the SRS research program. The goals of these two groups are to identify effective research results, to bring them to the attention of practitioners, and to promote the use of innovations from research to improve services to the handicapped, the socially and culturally disadvantaged, the aged, and other groups of people in need.

2. The task force has issued guidelines concerning the role of the RUS to State rehabilitation agencies. Among them are these:

(a) As liaison among the State agency, the regional office, and the research program, the RUS will translate research findings into programs which will serve larger numbers of clients more effectively.

(b) The RUS will be selected by State rehabilitation agencies and largely supported by SRS research funds during a 5-year period of development of the role of the new change agent.

(c) To experiment with the change agent concept, SRS will begin by supporting a RUS in one State of each region. Each regional office will select the State, which will then submit a proposal for the RUS project to SRS.

3. A second conference in 1968 spawned the following conclusions:

(a) The role of the RUS is not merely to persuade people to adopt innovations coming from research, but also to help them adapt the findings for use in practical situations.
(b) The RUS will have the difficult job of functioning as both an administrator and a sympathetic listener. He must be able to work effectively with the researcher, and also speak the language of the practitioner.
(c) The RUS will implement the findings of previously accomplished research. He will also stimulate new research in those areas directly related to the needs of fieldworkers.
(d) In addition to working with professionals in rehabilitation, the RUS must maintain close communication with the disabled and disadvantaged people who are served in the rehabilitation program.
(e) While the RUS may not often work individually with rehabilitation counselors, he will need to do so on occasion so that he will be aware of their needs and problems.
(f) The new discipline should probably be placed in the personnel structure on a level with State supervisors of staff development and State facilities specialists.
(g) The magnitude of the RUS program in SRS must be great enough to insure that its effect can be detected.
(h) Communication among the RUS trainees will be stressed during the training period, rather than the didactic, lecture-teaching method of instruction.
(i) Evaluation will be conducted to determine the effect of training programs on the attitudes, perceptions, and skills of the RUS and to note the number and kinds of changes the RUS effects in the delivery of rehabilitation services.

217

KNOWLEDGE UTILIZATION: EDUCATION

Innovation
Information needs

EMPIRICAL STUDY

Rittenhouse, Carl H. *Innovation problems and information needs of educational practitioners.* Menlo Park, Calif.: Stanford Research Institute, SRI-URU 8084, May 1970. (Final Report for U.S. Office of Education, Contract No. OEC 09-099009-4590.)

Purpose

The purpose is to identify those problems of educational practitioners which might be solved by information generated by research developments; to determine what type of information would be helpful in making decisions concerning educational improvements. The aim is to aid the Office of Education in targeting future interpretive studies.

Method

The inquiry was carried out primarily by mailed questionnaires, supplemented by some in-person interviews. An initial questionnaire was sent to superintendents of 1,203 school districts in the country and to chief executive officers of 2,196 institutions of higher education. From a list of innovative programs, respondents were asked to check which had been adopted or were under consideration for adoption. A second questionnaire was sent to 150 institutions in each of the above categories, asking, with respect to the five higher ranking program items in Phase I, the types of information they had needed, where it had been obtained, and its degree of importance in relation to decision making. Conclusions were based on survey findings and previous relevant studies.

Findings and Conclusions

1. Concerning elementary and secondary school districts:

(a) Process of change is usually orderly, but the search for information is less orderly. These districts need access to information from districts similar to their own.
(b) The school superintendent is the key individual in the change process.
(c) Larger districts, with greater resources and capabilities, are more innovative than the smaller ones.
(d) Users are less interested in research findings presented in professional journals than in information oriented to operations.

2. Concerning institutions of higher education:

(a) The change process is more complex at this level than it is for elementary and secondary schools, and the responsibility for change more diffuse.
(b) Personnel at these institutions are more sophisticated than their elementary and secondary school counterparts in searching out the information they need.
(c) Those institutions that engage in long-range planning tend to be orderly and rational about anticipating future change and preparing for it; the preparation includes making use of available research.

3. The author recommends that surveys such as those conducted in this project be repeated (with some suggested modifications) periodically in order to systematize and update information concerning the problems and needs of educational practitioners.

218

RESEARCH UTILIZATION: MENTAL HEALTH

Innovation factors

EMPIRICAL STUDY

Roberts, A. O. H. and Larsen, J. K. *Effective use of mental health research information.* Palo Alto, Calif.: American Institutes for Research, AIR-820, January 1971. (Final Report for National Institute of Mental Health, Grant No. 1 RO1 MH 15445.)

Purpose

The starting point in this study was an identification of innovative programs already introduced in an institution, then tracing them backwards to the source of the innovation. The objectives were to identify empirically those conditions which facilitate or inhibit utilization of mental health research and to derive implications for means to increase information use.

Method

Data were collected first by interview with staff members in five mental health institutions, then in try-out questionnaires sent to institutions in 17 western states, then by visits to six more western institutions at which about 60 persons were interviewed, and ultimately in a questionnaire survey involving 207 institutions located primarily in those states east of the Mississippi River. From these 207 institutions, responses were received from 588 innovators, 97 librarians and 88 administrators.

Findings and Conclusions

1. Most persons who attempt to initiate improved mental health care practices (innovators) get their ideas from the work or experience of others (practitioners) rather than from outside sources (researchers). Most innovations are the result of experience, not research.

2. The primary source of the innovative idea is personal contact. Formal communication channels (books, journals, speeches, etc.) proved to be relatively unproductive. Contact with others, whether in person or by mail, was preferred to formal documentation.

3. The strategic personal contact was the well-informed colleague ("gatekeeper"). Valued channels for maintaining colleague contact included

staff meetings, informal as well as formal consultation and discussion, site visits, seminars and colloquia.

4. Library staff size and the existence of a central library were important to innovative state mental illness (MI) institutions; the number of books checked out and the number of journals in the library were important in state mental retardation (MR) hospitals.

5. Contact with an in-house research department had a positive value in state MI but a negative value in state MR.

6. To summarize: the single source of variance which can be manipulated to increase information utilization is personal interaction; if the ideas that come from such interaction provide the catalyst for information-seeking behavior, other sources of information will be used.

219

RESEARCH SURVEY: MENTAL HEALTH

Planned change
Community research

COMMISSION REPORT

Robinson, R., DeMarche, D. F., and Wagle, M. K. *Community resources in mental health.* (A report of the Joint Commission on Mental Illness and Health). New York: Basic Books, 1960.

Purpose

The overall purpose of the project was "to gain knowledge and understanding of community resources for mental health so that their contribution to the nation's mental health may be facilitated and increased." This included the identification of community resources, their assessment, the charting of the flow of case discovery and referral, and the assessment of the value of various constellations of services in behalf of mental health. In a word, the study sought information that might prove helpful in the *planning* of a community mental health program.

Method

Qualitative and quantitative data were gathered, largely through interviews, within fifteen selected counties out of the then 3,103 counties in the United States. Many agencies cooperated in gathering the data.

Findings and Conclusions

1. Specific findings are presented for the following areas of inquiry:

(a) Public health services.
(b) Public welfare: insurance.
(c) Public welfare: assistance.
(d) Child welfare.
(e) Court services.
(f) The schools.
(g) Recreation and group work.
(h) The churches.
(i) Family casework.
(j) Mental health clinics.
(k) Other community resources.
(l) Planning, coordinating, and financing agencies.
(m) The supply of community resources.
(n) Configurations of community resources.

2. In addition to specific conclusions, a number of general propositions are presented:

(a) While a wide range of community resources were identified, the resources for helping people with emotional and behavioral disorders are often too few and too poorly equipped to do the expected job.
(b) In keeping with the diversity of cultural settings, community program design and treatment methods need to vary considerably.
(c) The importance of consultation with knowledgeable persons in the several communities and help from public and voluntary agency consultants are necessary to good program building.
(d) Despite variations, there is need, nevertheless, for a generic approach that covers the

mental health field broadly, and consultants should reflect generalist as well as specialist points of view.

(e) Formal and informal ties between committees and experts should be maintained, and training facilities in the form of institutes, conferences, and extension courses should be provided.

(f) The development of qualified manpower of various types is essential to an effective program.

(g) While most of the proposed lines of action do not need to await further research and experimentation, a broad research program, concurrent with action, is recommended.

3. An appendix details the basis for assigning a community mental health resources score to counties throughout the United States.

220

RESEARCHER-PRACTITIONER RELATIONSHIPS

Utilization barriers

ANALYSIS

Rodman, H., and Kolodny, R. Organizational strains in the researcher-pratitioner relationship. In A. W. Gouldner and S. M. Miller (Eds.), *Applied sociology: Opportunities and problems*. New York: Free Press, 1965.

Purpose

With social science research increasingly moving into clinical settings (mental hospitals, child guidance clinics, social work agencies), the authors undertake to explore the problems that researchers and practitioners encounter under such circumstances, and to determine whether some of the problems stem from the organizational structure of the professional agency.

Method

The analysis is based partly on the authors' experiences and partly on a review of the literature.

Findings and Conclusions

1. To some extent, the conflict between practitioner and researcher arises from different orientation (human beings versus statistics; the intuitive versus the logical), but cannot totally explain the problems which are encountered when a researcher works in a clinical setting.

2. Often, the prime function of the researcher is to undertake an evaluation. This, by its very nature, threatens the practitioner. What the social scientist thinks of as an objective investigation is perceived by the practitioner as a hostile attack.

3. The researcher and the practitioner have totally different organizations of work and time. The practitioner tends to have his workday tightly scheduled; the researcher often has a more flexible work schedule. The researcher is often younger than the practitioner, yet he tends to have more prestige and higher monetary rewards. The researcher places a great deal of emphasis on record-keeping, and by doing so, tends to add to the workload of the already burdened practitioner.

4. The researcher frequently neglects to give publication credit to the practitioners who have helped him.

5. The researcher, by virtue of his placement within the organizational structure, tends to have official lines of communication with administration rather than with the practitioners.

6. The researcher is often in a marginal position with respect to the workfield in which he is conducting research. The practitioners within an agency "share a professional culture which they act out in their daily experiences." The researcher tends to be the loner, the outsider.

7. Practitioners may react to this stressful situation by denial and displacement, in which the researcher is not only isolated but virtually annihilated. Sometimes this seeming attack on the research is a covert attack upon the administration.

8. In some agencies, practitioners deal with the researcher through a style of one-way humor

which stresses the latter's marginal position.

9. Several formal ways of alleviating this nonproductive stress are reported: supporting the researcher with an outside consultant; appointing a professionally trained practitioner to the researcher role; using the researcher-practitioner team approach (in some cases the practitioners actually originate the research and hire the social scientists); delegating the research responsibility to an outside agency so that its focus is academic rather than clinical and the clinicians become the marginal members of the unit.

221

INNOVATION DIFFUSION

Adoption characteristics
Adopter attitudes
Change agent

REVIEW OF LITERATURE

Rogers, Everett M. *Diffusion of innovations.* New York: Free Press, 1962.

Purpose

To synthesize and evaluate available research findings and theories on the diffusion of innovations in order to attempt to identify the common threads that run through all the research traditions on the subject of diffusion.

Method

More than 500 publications on diffusion of innovations are reviewed, including 11 major research projects of the author. While the author writes from a background of rural sociology, the survey of research literature is multidisciplinary in scope, reviewing relevant material in the fields of anthropology, sociology, education, economics, industrial engineering, industrial history, and public health.

Four essential elements in the analysis of diffusion are: (1) the innovation, (2) its communication from one individual to another, (3) in a social system, and (4) over time. Given this basic framework, Rogers defines several basic concepts for his analysis:

Innovation—an idea perceived as new by the individual.

Diffusion—the process by which an innovation spreads from its source of invention or creation to its ultimate users or adopters.

Social system—a population of individuals who are functionally differentiated and engaged in collective problem-solving behavior.

Adoption—a decision to continue full use of an innovation.

Adoption process—the mental process through which an individual passes from first hearing about an innovation to final adoption.

Innovativeness—the degree to which an individual is relatively earlier in adopting new ideas than the other members of his social system.

Adopter categories—classifications of individuals within a social system on the basis of innovativeness.

Findings and Conclusions

1. Certain *characteristics of the innovation,* as perceived by members of a social system, affect its rate of adoption:

(a) *Relative advantage*—the degree to which an innovation is superior to ideas it supersedes. A crisis emphasizes the relative advantage of an innovation and affects its rate of adoption.

(b) *Compatibility*—the degree to which an innovation is consistent with existing values and past experiences of the adopters.

(c) *Complexity*—the degree to which an innovation is relatively difficult to understand and use. The research evidence is "far from conclusive" regarding this factor.

(d) *Divisibility*—the degree to which an innovation may be tried on a limited basis (trialability). Several investigations suggest that earlier adopters may perceive divisibility as more important than later adopters.

(e) *Communicability*—the degree to which the

results of an innovation may be diffused to others.

2. The *adoption process* consists of five stages: Awareness, interest, evaluation, trial, adoption.

(a) There is little evidence that lack of knowledge about innovations actually delays their adoption. (Assuming there is awareness.)
(b) Awareness occurs at a more rapid rate than does adoption.
(c) The first individuals to adopt innovations require a shorter adoption period than do relatively later adopters.
(d) The awareness-to-trial period is longer than the trial-to-adoption period.
(e) The awareness-to-trial period is shorter for relatively earlier adopters than for later adopters.
(f) The trial-to-adoption period is longer for relatively earlier adopters than for later adopters.

3. *Five classes of adopters may be identified based upon degree of innovativeness: innovators (venturesome); early adopters (respectful); early majority (deliberate); later majority (skeptical); laggards (traditional).*

(a) Innovativeness of individuals is related to having a modern rather than a traditional orientation.
(b) An individual's innovativeness varies directly with the norms of his social system regarding innovativeness.
(c) There is considerable shifting of individuals in a social system from one adopter category to another over time.
(d) Occupants of each adopter category are mainly influenced by individuals of the same or a more innovative adopter category.
(e) Differences in innovativeness between individuals are a more important barrier to the flow of ideas in a social system where the norms are modern than where they are traditional.
(f) Adopter distributions follow a bell-shaped curve over time and approach normality.

4. *Some generalizations may be made regarding adopter categories:*

(a) Innovators are perceived as deviants by other members of their social system.
(b) Innovators perceive themselves as deviant from the norms of their social system.
(c) Earlier adopters have higher social status than later adopters.
(d) Earlier adopters have a more favorable financial position than later adopters.
(e) Earlier adopters have more specialized operations than later adopters.
(f) Earlier adopters are more cosmopolite than later adopters.
(g) Earlier adopters have more opinion leadership than later adopters.
(h) Relatively later adopters are more likely to discontinue innovations than are earlier adopters.
(i) Laggards are most likely to drop out of the social system.

5. *The influence of opinion leaders—those individuals from whom others seek advice and information—affects adoption of innovations.*

(a) Opinion leaders conform more closely to social system norms than the average member.
(b) There is little overlapping among the different types of opinion leaders.
(c) Opinion leaders use more impersonal, technically accurate, and cosmopolite sources of information than do their followers.
(d) Opinion leaders are more cosmopolite than their followers.
(e) Opinion leaders have more social participation than their followers.
(f) Opinion leaders have higher social status than their followers.
(g) Opinion leaders are more innovative than their followers.
(h) Social system norms on innovativeness seem to determine, at least in part, the innovativeness of opinion leaders.

6. *Different kinds of information are important to different adopter categories and at different stages of the adoption process.*

(a) Earlier adopters utilize information sources that are in closer contact with the origin of new ideas than later adopters.
(b) Earlier adopters utilize a greater number of different information sources than do later adopters.
(c) Personal influence from peers is most important at the evaluation stage of the adoption process and less important at other stages.
(d) Personal influence from peers is more important for relatively later adopters than for earlier adopters.
(e) Personal influence from peers is more important in uncertain situtations than in clear-

cut situations.

(f) Impersonal information sources and cosmopolite information sources (sources external to a particular social system) are most important at the awareness stage, and personal and localite sources are most important at the evaluation stage.

(g) Impersonal and cosmopolite sources of information are more important than personal and localite sources for relatively earlier adopters than for later adopters.

7. *The role of change agent may significantly affect diffusion and adoption.*

(a) The extent of promotional efforts by change agents is directly related to the rate of adoption of an innovation.

(b) Commercial change agents (e.g., salesmen) are more important at the trial stage than at any other stage in the adoption process.

(c) Commercial change agents are more important for earlier adopters than for later adopters at the trial stage.

(d) Change agents have more communication with higher status than with lower status members of a social system.

8. *Five guidelines for a projected strategy of change might be considered by change agents:*

(a) A program of change should be tailored to fit cultural values and past experiences.

(b) A change agent's clients must perceive a need for an innovation before it can be successfully introduced.

(c) Change agents should be more concerned with improving their client's competence in evaluating new ideas and less with simply promoting innovations per se.

(d) Change agents should concentrate their efforts upon opinion leaders in the early stages of the diffusion of an innovation.

(e) The social consequences of innovations should be anticipated and prevented if undesirable.

222

INNOVATION DIFFUSION
Knowledge dissemination: rehabilitation

ANALYSIS

Rogers, Everett M. Communication of vocational rehabilitation innovations. *Communication, dissemination, and utilization of rehabilitation research information.* Washington, D. C.: Joint Liaison Committee of the Council of State Administrators of Vocational Rehabilitation and the Rehabilitation Counselor Educators, Department of Health, Education, and Welfare, 1967, Studies in Rehabilitation Counselor Training, No. 5, pp. 19-32.

Purpose

In this paper the author concentrates on the problem of dissemination of innovation in the field of vocational rehabilitation. He reviews established principles of diffusion of innovations, identifies some unique attributes of the vocational rehabilitation setting which affect the applicability of these generalizations, and draws some implications for action and for future research.

Method

The author draws from his own knowledge and experience as well as the knowledge of others in the area of innovation diffusion and research utilization.

Findings and Conclusions

Diffusion may be viewed as the *communication* of an *innovation* from some *source* to members of a *social system* over *time.* Some general principles which apply to these core factors are:

1. *Source:*

(a) The credibility of the source of an innovation to the potential adopters influences its adoption; the more credible the source of an innovation, the greater is the likelihood of its adoption.

(b) The flow of innovations is affected by the social distance between the source and potential users. Such distance increases the probability of communication breakdown.

The fact that rehabilitation sources are often far removed from potential users is a significant feature of this field.

2. *Innovation:*

(a) The perception of the *relative advantage* of an innovation is important to its adoption. Vocational rehabilitation innovations are often of low relative advantage or are difficult to assess.
(b) The *compatibility* of an innovation with the existing values and past experiences of the adopters affects its adoption.
(c) The *complexity* of an innovation affects the rate of dissemination; the more-difficult-to-understand innovation will be disseminated more slowly.
(d) The *divisibility* of an innovation affects its adoption. For example, counselors are more likely to adopt a new technique with all clients after they have successfully tried it out on a few clients.
(e) The *communicability* of an innovation, especially in terms of having visible results, influences adoption. Nonmaterial ideas diffuse more slowly than material innovations.

3. The nature of the communication channels which, like the source and the unit of adoption, affect the rate of adoption. Mass media channels are most useful in securing awareness and increasing the level of knowledge about innovations; to secure attitude change and actual adoption of an innovation, interpersonal communication is more effective.

4. Receivers of innovations may be categorized along a continuum of innovativeness (viz., the relative earliness or lateness of adoption of an idea in comparison with other members of the given social system). The five adopter categories are: innovators, early adopters, early majority, late majority, and laggards.

5. *Distinctive Aspects of Diffusion in Vocational Rehabilitation.* Several distinct features of the field of vocational rehabilitation (VR) may be identified which affect the diffusion of innovations in this field and the applicability of diffusion findings based on studies in different fields:

(a) The social system receiving the innovation consists of professionals. Studies of diffusion in other professional fields indicate that the professionalism of potential adopters is an important influence on the way in which innovations spread. Since most diffusion studies have involved nonprofessional adopters, care should be exercised in generalizing findings from these fields.
(b) The physical and social distance between the source of innovation and the potential adopters is often considerable. The VR counselor in one part of the country may be the potential user of an innovation developed in a psychology lab of a university in another state. Even if the counselor is a regular reader of journals in his field, the chances are poor that he would discover this innovation, since it would probably be reported in a psychology journal. Relatedly, VR is faced with a problem of how to obtain relevant information that is developed in other fields, but is outside the immediate subject area and hence not in the "knowledge path" of VR personnel.
(c) VR hierarchical structures often act as barriers or forces of resistance to innovation diffusion in that the organizational structure tends to create both horizontal (especially between agencies) and vertical communication barriers.
(d) The type of innovation decision is often "forced" rather than "optimal," and is likely to be made collectively rather than individually. Forced, or authoritative, decisions are more likely to be circumvented and/or discontinued. Group decision making is a longer process, but is more likely to result in lasting change.
(e) VR innovations seldom have high relative advantage, and the effects are of low visibility and are difficult to evaluate in the short range.
(f) The "closure" orientation of VR personnel serves to divert attention from consideration of innovative ideas. An emphasis on the quantity of closed cases rather than the quality of services rendered leaves counselors with little time to "fool around" with research results. It also supports a focus on short-range goals, while gains from innovations are likely to appear on a long-range basis.

6. *Recommendations for More Effective Dissemination.*

(a) Establish better communication links between the source and the potential users of innovations.
    (1) Change agents are needed to disseminate research findings to practitioners.

(2) A liaison role, such as that of the extension specialist in agriculture, is needed to facilitate two-way communication between researchers and counselors.

(b) Determine the relative effectiveness of certain demonstrations and demonstration methods as compared to others. The findings in agriculture are that the most effective demonstrators—
  (1) are more similar to their followers;
  (2) are not overly identified with the agencies of change; and
  (3) demonstrate innovations which are communicable and not too complex.

(c) VR personnel should be encouraged to become better research consumers. One means would be to consolidate research input to counselors, as part of either pre-service or in-service training, into a single course focused on information about research for the practitioner.

(d) Establish an information retrieval system for relevant research results. A retrieval system designed to meet VR information needs would help to short-circuit the bureaucratic barriers to innovation dissemination.

(e) Bring VR researchers and administrators into the world of the counselor upon occasion. Research thus developed from a shared reality would be more likely to have relevance for potential users.

223

INNOVATION DIFFUSION

Change process: social
Innovation characteristics
Change agent
Communication theory

REVIEW OF LITERATURE

Rogers, E. M., with Shoemaker, F. F. *Communication of innovations: A cross-cultural approach.* New York: Free Press, 1971.

Purpose

To synthesize, from research on the diffusion of innovations, a series of generalizations, each of which represents the relationship found between two or more ideas; to thereby facilitate understanding of the diffusion process by change agents and social scientists in order to provide linkages with more general social science theory; to suggest areas of needed research, and to prevent unnecessary duplication of research effort.

Method

More than 1,500 publications on diffusion are reviewed to relate empirical understandings about the diffusion of ideas to a theory of social change. Cross-cultural similarities and contrasts are treated in diffusion generalizations. A comparison of diffusion understandings is made between more and less developed countries.

Findings and Conclusions

1. Communication is essential for social change.

(a) *Social change* is the process by which alteration occurs in the structure and function of a social system through:
  (1) *invention*—creation and development of new ideas;
  (2) *diffusion*—communication of these ideas to members of the social system; and
  (3) *consequences*—changes that occur in the system as a result of adoption or rejection of the innovation—
    • *immanent change*—members of a social system create and develop a new idea with little or no external influence; and
    • *contact change*—sources external to the social system introduce a new idea. *Selective contact* change is adop-

tion or rejection of a new idea on the basis of needs. *Directed contact change* is caused by outsiders who introduce new ideas in order to achieve predetermined goals. Much change that occurs today is *directed contact change* and is therefore the main concern of this book.

(b) *Middle-range analysis* is an approach to a theory of social change consisting of accumulating and synthesizing middle-range generalizations from empirical results on the diffusion of innovations. This approach, which could eliminate the lack of rapprochement between research and theory, is as follows:
(1) Explicate all essential concepts.
(2) Postulate a relationship between two concepts in a *theoretical hypothesis.*
(3) Test this hypothesis with a corresponding *empirical hypothesis,* which is the postulated relationship between two operational measures of concepts (an operation is the empirical referent of a concept).
(4) Support or reject a theoretical hypothesis by testing corresponding empirical hypotheses, resulting eventually in a series of middle-range generalizations.

Middle-range generalizations are the stepping stones to more general theories of social change, once abstracted to a higher level of generality.

(c) *Communication* is the process by which messages are transferred from a source to a receiver.

(d) *Diffusion* is a special type of communication concerned with the spreading of messages that are *new* ideas. Risk is often associated with the reception of innovations. An individual's behavior varies, with the reception of new ideas and risks, from his reaction to routine ideas. This behavior may be dependent on:
(1) *heterophily*—degree to which pairs of individuals who interact are different in certain attributes such as beliefs, values, education, social status, etc., and
(2) *homophily*—degree to which pairs of individuals who interact are similar in certain attributes.

Most human communication takes place between individuals who are *homophilous*, which leads to more effective communication. But in the diffusion of innovations, there is often *heterophily* between source and receiver, which leads to special problems in securing effective communication.

(e) *The main elements in the diffusion of new ideas* are:
(1) *The innovation*—an idea, practice, or object perceived as new by the individual, the characteristics of which, as perceived by members of a social system, determine its rate of adoption; five general characteristics of innovations are:
- *Relative advantage*—degree to which new idea is better than the idea it supersedes.
- *Compatibility*—degree to which new idea fits in with existing values, experiences, and needs of receivers.
- *Complexity*—degree to which innovation is perceived as difficult to understand and use. (This is the only innovation attribute seen as *negatively* related to its rate of adoption.)
- *Trialability*—degree to which new idea may be experimented with on a limited basis.
- *Observability*—degree to which results of an innovation are visible to others.

(2) *Rate of adoption*—relative speed with which an innovation is adopted by members of a social system. Factors other than attributes that affect rate of adoption:
- Type of innovation decision.
- Nature of communication channels used to diffuse the innovation.
- Nature of the social system.
- Extent of change agents' promotion efforts in diffusing the innovation.

Diffusion effect—cumulatively increasing degree of influence upon an individual to adopt or reject an innovation because of increasing rate of knowledge about the innovation and because of the adoption or rejection of the innovation in the social system.

Adoption can be expected once the awareness-knowledge level *exceeds 20 to 30* percent of members in a social system.

The diffusion effect is greater in social systems with a higher degree of *communication integration*—degree to which units in a system are interconnected by interpersonal communication channels.

Overadoption—adoption of an innovation by an individual when experts feel he should reject, because of:

- Insufficient knowledge.
- Inability to predict consequences.
- A mania for the new.

(3) *Communication channels*—the means by which a message gets from a source to a receiver.

- *Interpersonal channels*—those that involve a face-to-face exchange between two or more people.
- *Mass media channels*—all means that involve a mass medium, such as radio, television, film, newspapers, where a few individuals (or one) can reach many.

Mass media channels are more important at the knowledge function in the innovative-decision process, and interpersonal channels are relatively more important at the persuasion function.

Mass media channels are more important than interpersonal channels for earlier adopters than for later adopters.

- *Media forums*—small groups of individuals who meet regularly to receive a mass media program and discuss its contents. They combine mass and interpersonal channels. They are effective in less developed countries because they exert social pressure on attendance and participation and on attitude change in small groups.

(4) *Time*—referring to the amount of time of the *innovation-decision process*, which is the mental process through which an individual passes from first knowledge of an innovation to a decision to adopt or reject and to confirmation of this decision: (a) knowledge, (b) persuasion, (c) decision (adoption or rejection), and (d) confirmation (reinforcement or reversal of previous decision).

(5) *Three main types of innovation decisions are:*

- *Optional decisions*—made by individuals regardless of decisions made by other members of the system.
- *Collective decisions*—made by consensus of individuals in the social system by a series of sub-processes:

stimulation of interest in new idea;

initiation of new idea into system;

legitimation of new idea by power holders;

decision to act; and

action or execution of idea.

Stimulators of a social system are more cosmopolitan and perceive needs quickly. *Initiators* favor change and know their system well. *Legitimizers* are high-status power holders.

The *rate of adoption* of a collective innovation is positively related to the degree to which the *legitimizers* are involved in the decision-making process and to the degree of power concentration in the social system.

Member acceptance of collective innovation decisions is positively related to member cohesion (*participation* in decision-making process) with the social system.

Change agents can be stimulators and initiators of collective innovation decisions but can seldom be legitimizers, because they lack high status, social power, and established credibility.

- *Authority decisions*—forced on an individual by someone in a superordinate power position.

Authority innovative decisions are common in *formal organizations*—social systems deliberately established for achieving predetermined goals, where there are prescribed roles, an authority structure, formal system of rules and regulations, and informal practices peculiar to each organization.

Authority innovation-decision process:

knowledge about need for change on the part of the decision unit (from internal or external sources);

persuasion and evaluation of new idea by decision unit;

decision to accept or reject by decision unit;

communication of decision by unit to organization; and

action by *adoption* units—their participation in decision-making process

will influence their satisfaction with new idea; nonparticipation could lead to *innovation dissonance*, which is a discrepancy between an individual's attitude toward an innovation and his decision to adopt or reject it.

(6) *Two basic approaches to organizational change* are:
- Authoritative—decisions made by centralized power.
- Participative—wide sharing of power.

The rate of adoption is *faster* by authoritative approach but more likely to remain *stable* with participative approach.

The innovation-decisions process: (a) best fits the case of optional decisions, (b) must be modified for collective and authority decisions, and (c) may vary in its stages for some individuals and innovators.

There is a need to know whether the nature of the innovation-decision process is different for innovators than for laggards.

(7) *Discontinuance*—decision to cease use of innovation after adopting it.
- *Replacement discontinuance*—rejection of innovation for a better idea.
- *Disenchantment discontinuance*—rejection of innovation because of its unsatisfactory performance.

(8) *Relative innovativeness*—degree to which an individual is earlier in adopting new ideas than other members of his social system: (a) innovators, (b) early adopters, (c) early majority, (d) late majority, and (e) laggards.

Late adopters are more likely to discontinue innovations than are earlier adopters.

Innovations with a high rate of adoption have a low rate of discontinuance.

Early adopters have a shorter innovation-decision period than late adopters because the rate of awareness knowledge for an innovation is more rapid than its rate of adoption.

Early adopters tend to be more modern, better educated, have greater rationality, more favorable attitudes toward change and risk.

(f) *Diffusion* occurs within a social system because the system's social structure can have an important influence on the spread of new ideas.

(1) *Social structure*—statuses or positions in a social system and how these statuses are arranged (hierarchical, etc.); it acts to impede or facilitate the rate of diffusion and adoption of new ideas through "system effects":
- *norms*—established behavior patterns for members of a social system, *modern norms* existing in a more change-oriented system than *traditional norms*;
- *opinion leadership*—degree to which an individual is able to informally influence other individuals' attitudes or overt behavior in a desired way with relative frequency.

Opinion leaders are important in diffusion of innovations.

Opinion leaders are receivers of communications who pass information on to followers.

Opinion leaders can be barriers to innovations in a social system if they are homophilous with followers and contrary to the innovations.

Opinion leaders have greater mass media exposure than followers.

Opinion leaders conform more closely to a system's norms than do their followers. When system's norms favor change, opinion leaders are more innovative.

Polymorphism—individual acts as opinion leader for a variety of topics.

Monomorphism—individual acts as opinion leader for one topic.

When a system's norms are more modern, opinion leadership is more monomorphic.

(2) *Change agent*—professional person who attempts to influence innovation decisions in a direction he feels is desirable:
- develops a need for change in clients;
- establishes a change relationship with them;
- diagnoses problems;
- creates in clients an intent to change;
- translates intent into action;
- stabilizes change, prevents discontinuances; and
- achieves terminal relationship with clients.

Change agent success is related to:

- extent of change agent effort;
- client orientation rather than change-agency orientation;
- how compatible program is with clients' needs;
- his emphathy with clients;
- his homophily with clients;
- extent he works through opinion leaders;
- credibility in eyes of his clients; and
- his efforts in increasing clients' ability to evaluate innovations.

Change agent contact is related to:

- higher social status among clients;
- greater social participation;
- higher education and literacy; and
- cosmopoliteness.

(3) *Diffusion research* is emerging as a single, integrated body of concepts and generalizations, even though investigations are conducted by researchers in several scientific disciplines. A *research tradition* is a series of investigations—approached from such major fields as anthropology, early sociology, rural sociology, education, medical sociology, communication, and marketing—on a similar topic in which successive studies are influenced by preceding inquiries.

There are five major shortcomings of diffusion research:

- dependence on recall data and difficulties in determining the time-order of diffusion variables;
- overemphasis on the nature of innovations studied leads to separate diffusion research traditions which can impede integration of the field;
- overconcern with optional decisions, to the exclusion of collective and authority decisions;
- use of individual as a unit of analysis rather than depending on a relational analysis, which is more appropriate for diffusion studies; and
- concentration on the United States and Western Europe, retarding cross-cultural testing of generalizations.

(g) *Consequences*—changes that occur in a social system as a result of adoption or rejection of an innovation.

(1) Consequences have not been studied (as have *invention* and *diffusion*) because:

- change agencies overemphasize adoption, assuming consequences will be positive;
- research methods may be inappropriate to measure consequences; and
- consequences are difficult to measure.

(2) Consequences may be classified as:

- *functional* (desirable) or *dysfunctional* (undesirable);
- *direct* (occur in immediate response) or *indirect* (result from direct); and
- *manifest* (intended by members) or *latent* (not intended).

(3) Three intrinsic elements of an innovation:

- *form*—observable physical appearance;
- *function*—contribution to members' way of life; and
- *meaning*—subjective perception of innovation by members.

Change agents can more easily anticipate form and function of an innovation for their clients than its meaning.

(h) *Equilibrium*—must be considered to determine an ideal rate of change.

(1) *Stable equilibrium*—almost no change in social system.

(2) *Dynamic equilibrium*—rate of change is equal to system's ability to cope with it.

(3) *Disequilibrium*—rate of change is too rapid to permit system to adjust.

Change agents generally want to achieve a rate of change that leads to dynamic equilibrium, somewhere short of disequilibrium.

2. Research is needed on the attributes of innovations:

(a) Measuring perceived attributes at the time of decision.

(b) Measuring differential perceptions by different groups.

(c) Improving measurement of perceived attributes.

(d) Making factor analyses of perceived attributes.

(e) Studying innovation bundles rather than single innovations.

(1) In the minds of adopters, an innovation is not a single, discrete, separate unit for analysis.

(2) Does adoption of any single innovation trigger adoption of other ideas in the complex of innovations?

224

CHANGE PROCESS
Diffusion factors
Communication process

ANALYTICAL MODEL

Rogers, E. M., and Svenning, L. *Managing change.* Washington, D.C.: Operation PEP, U.S. Office of Education, Department of Health, Education, and Welfare, 1969.

Purpose

The purpose of this document is to provide the reader with: a general understanding of change, communication, and diffusion processes; a series of principles and strategies that can be utilized in planning and implementing change; a set of guidelines and strategies for managing unique change situations that may face him.

Method

The material is synthesized from the existing literature on the subject.

Findings and Conclusions

1. A set of communication principles is set forth in terms of the significant variables, as follows:

(a) Source:
  (1) The communication is more likely to be favorably received if the source is credible, the receiver needs specialized information not at his disposal, the source is emphatic, the source and the receiver are homogeneous.
  (2) Communication is more likely to be unfavorably received if the source arouses anger or resentment in the receiver.

(b) Channel:
  (1) Mass media are more effective than interpersonal channels in creating awareness of ideas and in changing lightly held attitudes and beliefs.
  (2) Interpersonal channels are more effective in persuading and in changing deeply held attitudes and beliefs; they induce more lasting changes in attitudes than mass media do.

(c) Message:
  (1) If people know in advance that they are going to receive bad news, the emotional response to the message will be diminished.
  (2) The message which arouses anxiety tends to be ignored.
  (3) If your audience is ultimately going to be exposed to counterpropaganda, it is good strategy to present both sides of the issue at the outset.
  (4) It is effective to present the major arguments in the message at the outset.
  (5) To enhance message effectiveness, appeal to more than one of the senses.

(d) Receiver:
  (1) The receiver who values membership in the group tends to be conforming in his opinion and is influenced highly by messages from other group members.
  (2) Receivers with high prestige and popularity hold attitudes that conform with prevailing group norms.
  (3) Receivers with low self-esteem are persuaded more easily than those with high self-esteem.
  (4) Receivers who are hostile and aggressive in interpersonal relationships do not respond readily to persuasive communication; receivers who display social withdrawal are equally unresponsive.
  (5) Communication is more effective when it is receiver oriented rather than source oriented.
  (6) Receivers tend to be more receptive to communication when they have a sense of participation and when the message is consistent with their existing knowledge, attitudes, and beliefs.

(e) Situation:
  (1) Rumors spread rapidly in time of stress and uncertainty.
  (2) In formal organizations, communication tends to be horizontal rather than vertical; such vertical communication as occurs, flows downward; only positive messages flow upward.
  (3) Change information is likely to spread more rapidly through informal than through formal channels in an organizational setting; formal communications

confirm what has already been diffused informally.

2. The following diffusion principles are offered:

(a) Innovation:
  (1) An innovation is adopted more rapidly during a period of crisis.
  (2) Factors which contribute to the rate of adoption of an innovation include: perceived advantage; compatibility; lack of complexity; suitability for trial adoption; communicability; visibility.

(b) Adopters:
  (1) The more traditional the social system, the more resistant to innovation will be the individual within the system.
  (2) Early adopters have the following characteristics when compared with later adopters: younger; higher social status; more likely to use communication channels close to the source of the innovation; more active information seekers; more cosmopolite; have more opinion leadership; wealthier; less dogmatic; have more formal education; have greater ability to deal with abstractions.
  (3) Individuals more fully embrace innovations and change when they feel they have participated in planning and decision making concerning these ideas.

(c) Communication channels:
  (1) Interpersonal communication from peers is more important for later adopters than for early adopters.
  (2) Interpersonal communication from peers is more important in uncertain (or high risk) situations than in clear-cut situations.

(d) Social systems:
  (1) In modern systems, opinion leaders are often innovators; not so in traditional systems.
  (2) In modern systems, diffusion flows between heterogeneous sources and receivers; in traditional systems, source and receiver tend to be homogeneous.
  (3) Members of a modern system are more closely related in interpersonal communication channels than are members of a traditional system.

(e) Change agents:
  (1) The efforts of a change agent speed the adoption of an innovation.
  (2) Change agents communicate most effectively with clients who are most like them.

3. The steps one can take in managing the change process are set forth:

(a) Define the objectives for specific change.
(b) Investigate alternative innovations.
(c) Define, distinguish, and analyze the target, decision, and adoption audiences.
(d) Define the steps that must be taken with each of these audiences to reach a decision, secure adoption, and achieve objectives of change.
(e) Select and employ those communication and diffusion principles most relevant to the specific change situation and develop change strategies to achieve previously defined objectives.
(f) Plan to integrate the innovation in the ongoing system.
(g) Evaluate the effects of the change.
(h) Diffuse your findings.

225

RESEARCH-PRACTITIONER RELATIONSHIPS

Research utilization: mental health

EMPIRICAL STUDY

Rose, M., and Esser, M. A. The impact of recent research developments on private practice. *American Journal of Psychiatry,* November 1960, 117, 429-433.

Purpose

To study the actual therapeutic methods used by psychiatrists in the treatment of various common mental disorders in order to obtain information about the theoretical convictions of psychiatrists

and the way in which these convictions influence actual treatment methods.

Method

A total of 25 practicing psychiatrists were interviewed. The sample was chosen at random and represented about 50 percent of the practicing psychiatrists in the San Francisco mid-peninsula area at the time.

The article also includes additional interpretation by J.M. Cotton, M.D., at the end of the report.

Findings and Conclusions

1. Although the psychiatrists were primarily psychologically oriented, they judged physical and pharmacological methods useful, and actually relied quite heavily upon them in daily practice.

2. Both psychotherapy and drugs were used by all of them, in varying proportions depending on individual taste and judgment, and largely symptomatically. The most common indication for the use of drugs was the severity of symptoms.

3. As a group, the psychiatrists were aware of, and respectful of, recent developments in physiological and pharmacological aspects of psychiatry, but they were not motivated to exert more than casual effort to learn about the basic concepts and hypotheses involved.

4. Their first concern is for the development of knowledge in the behavioral sciences as these are related to psychiatry: psychodynamics, sociology, anthropology, etc. Of secondary but serious interest was the continuation of research in the physiology of the nervous system and related organs.

5. The relation between a psychiatrist's theory and his actual use of various thereapeutic methods is not as simple and scientifically justifiable as one could wish.

DISCUSSION BY DR. COTTON

1. The impact of recent developments in neurophysiological research upon private practice has been very small.

2. The standard pattern appears to be one in which the therapy is primarily psychotherapy of an opportunistic variety styled to fit the individual needs of the patient as intuitively perceived by the therapist.

3. If the psychiatrist were limited to providing services upon a strict basis of proven scientific fact, he would not be able to do anything for 95 percent of those who sought his help.

226

RESEARCH UTILIZATION: SOCIAL WORK

Research utilization attitudes

EMPIRICAL STUDY

Rosenblatt, Aaron. The practitioner's use and evaluation of research. *Social Work*, 1968, 13, 53-59.

Purpose

The study reported herein was designed to ascertain social workers' ratings of the usefulness of research and the extent to which they use research findings in clinical practice.

Method

SAMPLE

Four different groups of caseworkers were surveyed:

1. First-year students at the Adelphi University School of Social Work distributed questionnaires to staff members at the field placements.

2. Two large social welfare agencies in New York City distributed the questionnaires to their employees.

3. Questionnaires were mailed to members of the 1956 graduating class of Columbia University School of Social Work.

4. Questionnaires were mailed to a random group of caseworkers listed in the current NASW membership directory.

The characteristics of the sample drawn from the 308 usable questionnaires returned were as follows: 82 men and 226 women, 204 caseworkers, and 103

supervisors, executives, and other specialists.* The average age was 39.6.

STUDY DESIGN

Data about research utilization were collected in the following four areas:

1. Use of research in handling difficult cases.
2. General value of research findings for respondent's practice.
3. The helpfulness of research in improving practice.
4. The helpfulness of research courses in preparing for a career.

The respondents were asked to compare reference to research with other practice activities including discussion of cases with supervisor, discussion with a fellow worker, discussion with a friend who was also a professional, discussion with a consultant, and thought but no consultation. They were asked to compare these activities in the following contexts:

1. A recently completed case in which some difficulties were encountered in deciding on a treatment plan.
2. Additional activities they would have undertaken in handling the same case had they more to develop a treatment plan.

In addition, the respondents were asked:

1. The value of supervision, consultation, and research findings for their practice on an 11-point scale.
2. To rank in order of importance eight experiences that contributed to the improvement of their practice. One of these experiences was reading research articles, another was reading practice articles.
3. To recall which eight courses included in their school training had been most helpful and least helpful in their careers. Research was one of the eight courses listed.

Findings and Conclusions

1. The author found that most practitioners undertook two or three activities before arriving at a treatment plan. Most often these were discussions involving their supervisor.

2. Although 29 percent of the respondents reported reading research articles, only 9 percent reported reading research articles in connection with specific cases.

3. Lack of time seems to be one reason that research is not utilized. Half of the respondents ranked their research courses as least helpful in current practice. Generally, research ranked least used and least useful of the activities compared in this study.

4. The author offers the following possible explanation of and observations on the findings:

(a) Individuals entering the field of social work may have felt that they were not equal to the scientific rigor (statistics, etc.) required to become psychologists. Therefore, the field of social work may be populated with individuals who have built a negative bias concerning research.
(b) Research findings may not be especially valuable in practical problem solution.
(c) Practitioners focus on case studies, viewing each case as unique. The efforts of the researcher to establish generalizations runs counter to this approach.
(d) Researchers may have difficulty in translating clinical theories into operational terms that can be tested. Therefore, the theories upon which many practices are based remained untested.
(e) While researchers must maintain a questioning attitude toward their work, a constantly questioning practitioner may be less effective. The researcher cannot only undermine the confidence of the practitioner, he may also disturb the practitioner by making him the object of his study.
(f) The report of research findings is often slanted to meet the needs of the other researchers rather than those of the practitioner.
(g) There is a rather low level of scientific knowledge to support the practices of its clinicians.

*One respondent failed to identify his position.

227

KNOWLEDGE DISSEMINATION: TECHNOLOGY

Communication media
Research utilization: industrial

EMPIRICAL STUDY

Rosenbloom, R. S. and Wolek, F. W. *Technology and information transfer: A survey of practice in industrial organizations.* Boston: Graduate School of Business Administration, Harvard University, 1970.

Purpose

To investigate how technical information flows across organizational lines in R&D operations in large industrial settings; to report on the circumstances related to various modes of transfer; to suggest ways of using information flow to integrate organizations.

Method

Survey data were collected and analyzed from 2,000 engineers and scientists in four corporations, and from 1,200 members of The Institute of Electrical & Electronic Engineers. The data describe instances in which respondents acquired useful technical information and the particular circumstances leading to the seeking of that information.

Findings and Conclusions

1. *By what means does information flow between technical groups?*

Scientists tend to make substantially more use than do engineers of sources outside the corporation. Among scientists, sources within their own corporation provide information in only one-third of the instances, as opposed to the strong majority—typically three-fifths—of such instances reported by engineers. The particular circumstances leading to acquisition of new information also figure importantly in the information-transfer process. In aggregate, only about half of the information acquired resulted from a specific search by the respondent. In nearly one-third of the cases, the information was acquired because someone pointed it out without being requested to do so. In about one-fifth of the cases, the respondent's intent in seeking information was to develop his general competence rather than to acquire some particular knowledge. The authors conclude that "information looking for the man" seems to be nearly as frequent as "man seeking information."

Controlling for differences between science and engineering as professions, the authors next determined the effects of (a) the organization, (b) the task, and (c) the user himself on the way information flowed. Engineers and scientists in research organizations used sources outside their own corporation in approximately two-thirds of the instances they described, whereas in a typical operating division, three-fifths to three-quarters of the responses cite information sources within the same organization. In both research and operating organizations, information for research tasks was gained from external sources more often than was information for design and development tasks, while interpersonal communication within the corporation was used less often for research than for design and development.

The authors investigated the influence of the individual user's experience and personal commitment. Interpersonal communication and local sources were used significantly more frequently when the respondent considered himself inexperienced in the source discipline. Seniority had a small but definite effect: men with more than ten years' tenure used corporate sources outside their own establishment 1½ times more frequently, and professional publications only half as often as men with brief tenure. Men with a high degree of commitment to their jobs tend to pursue formal education further and to make education a continuing process. These men use professional publications more often, and local sources of information less often, than the average respondent.

2. *What circumstances determine how information transfer takes place?*

Based on the concerns of managers and policy makers, the authors distinguished between informal sources inside the firm and formal sources outside the firm (principally the published literature). The authors' data showed that when the circumstances of work are such as to create a high expectation of contribution to a developing body of

knowledge, i.e., a professional focus, information will be transferred predominantly through the formal media. When the focus of work is principally upon intended contributions to ongoing operations, the transfer of information will occur primarily through informal media and will involve predominantly local sources.

3. *How can information flow help integrate an organization?*

The authors recommend that managers in organizations which include both professionally-oriented and mission-oriented activity should pay attention to linking the two. In organizing task assignments, management can allow development work to be clearly based in a discipline while providing an equally clear relation to an organizational mission. The resultant structure should facilitate the transfer of knowledge. In organizing document systems, managers should bear in mind that information is frequently found not as the result of a direct search related to a specific task, but as part of a more general quest for knowledge which will enhance the user's background or keep him up to date on professional developments. The more one has the knowledge to relate performance capabilities to general principles, or to relate research findings to the complex particulars of an operational system, the stronger will be the tie between the two areas.

In designing information flows, one should pay great attention to the role of the source. The idea is to produce literature that has an identity and fills a need, not a mere imitation of already existing sources. Managers should remember that they have an important influence on the informal, social fabric of their organizations. Policies relating to travel, guest visits, and telephone calls, etc., are an important part of the picture. Such activities, though not directly related to work, may provide important channels of information flow.

228

RESEARCH-PRACTITIONER RELATIONSHIPS

Research utilization: mental health

CASE ANALYSIS

Rosenfeld, J. M., and Orlinsky, N. The effects of research on practice: Research and decrease in noncontinuance. *Archives of General Psychiatry*, 1961, 5, 176-182.

Purpose

The authors describe changes in a service agency's functioning that occurred concurrently with a research program focused on these functions. In essence, the authors are issuing a warning to researchers about the interaction effects of research on practice.

Method

Since this was an almost after-the-fact study there were no specific methods set down. The authors describe the research program, the amount of staff participation in the research program, the initial awareness of the interaction effect, the selection of alternative criterion, and a refocusing on the changes in practice that occurred as a result of the initial research program.

Findings and Conclusions

1. The general research program dealt with personality factors associated with patient resistance to accepting recommended psychiatric treatment.

The original study focused on differences between patient and therapist perceptions of a therapeutic process and the effect of these differences on continuance or noncontinuance of treatment. The project as designed had no "action" program built into it, even though anyone familiar with research in a clinical setting would be prepared to anticipate the following:

(a) Any clinician doing research is never completely disinterested in service to patients.
(b) The activities of the researchers and the concomitant involvement of staff members, patients, and trainees in the project would have some effect on the clinic operations.

2. The whole staff of the psychiatric outpatient clinic of a general hospital participated in the project. The director of the clinic helped in the planning stages. The entire staff participated in a study of prediction of premature termination of psychotherapy from tape recordings of early therapy interviews. The intake staff helped revise forms directed toward facilitation of collection of data on noncontinuance.

3. There is little doubt that the sensitivity toward noncontinuance stimulated through the research project affected client-clinician contacts; however, interest and concern raised by the research project did not appear unusually high.

"The possibility that the research program and the functioning of the service might be affecting each other in significant ways was brought to the attention of the authors when discontinuance decreased to such an extent that it could no longer be used as a criterion measure."

4. The authors emphasize the following major findings:

(a) Noncontinuance decreased during the course of the research on noncontinuance.
(b) Other changes occurring during the research period included: (1) an increase in the number of interviews per patient; (2) improvement in the patient's concept of therapy; (3) more successful referrals of applicants to other services; and (4) a shifting of social worker comments at initial interviews from getting patient information and commenting on patient behavior to giving more information about clinical services and to correcting initial misconceptions about psychiatry.

5. The authors believe a substantial portion of change can be attributed to improvement of social workers' services and techniques, since caseload and clinic population did not change during the study. Evidently, the focus of the research and staff participation increased attention on the factors being studied. The increased awareness, in turn, led to behavior changes in the staff.

229

CHANGE MEASURES AND FACTORS
Innovation-adoption process: social
Organizational factors
Research-practitioner relationship

REVIEW OF LITERATURE

Rothman, J. *Planning and organizing for social change: Action principles from social science research.* New York: Columbia University Press, 1974.

Purpose

The book, in the words of the author, "aims to present to those engaged in social planning, community work, and social action what the outpouring of social science research has to say concerning intervention strategies and programs . . . By collecting community-level research findings and organizing them into conceptual categories which are of relevance to the practitioner—such as participation, organizational innovation, or the use of intervention roles—this work will aim to acquaint the community change agent with relevant social science information, providing a broader and better substantiated knowledge base to guide his practice than is currently available." It should be noted that the treatise is concerned, not with the substantive knowledge itself, but rather with *generalizations* and *action guidelines* as to *how such knowledge may be transmitted and utilized.*

Method

In accordance with the earlier stages of a research utilization model later to be described, the investigator, aided by a substantial staff, first engaged in a major retrieval approach of pertinent literature contained in thirty journals in social science fields over a six-year period from 1964 to 1970, supplemented by selected dissertations, papers read at Sociology and Social Work Conferences in 1968 and 1969, certain reports turned up in a

survey of the *Digest of Urban and Regional Research,* and miscellaneous books that came to the attention of the project staff. In all, 921 reports were retrieved and processed in the project, which was made possible through a grant by the National Institute of Mental Health.

From the above pool of reports some 228 generalizations, each accompanied by action guidelines were derived and categorized under the following chapter headings:

1. Practitioner roles: variables affecting role performance.
2. Practitioner roles: some dynamics of role performance.
3. Organizational behavior: contextual factors.
4. Organizational behavior: technology and personnel.
5. Political and legislative behavior.
6. Participation: voluntary associations and primary groups.
7. Participation: social movements, political action, client organization.
8. The diffusion and adoption of innovations.
9. Movement and assimilation of populations.

Each generalization is rated from 1 to 4 according to the number and character of the supporting studies, some of which are cited by way of illustration and elaboration. The studies bearing on each generalization are identified and listed in the extensive bibliographies accompanying each section of the book.

An introductory statement makes explicit the author's point of view, indicating in part a "general outlook that is of a nondoctrinaire, humanistic, exploratory social democrat" and a "basic posture [that] is a personalistic, skeptical leaning to the left." Reference is made to the number of different available avenues for social change, including rationalistic social planning, militant social action, and participatory self-help community development.

The treatise concludes with a succinct chapter on research utilization as a process that presents in detail the model employed in the present investigation together with a briefer account of other models and of considerations affecting the linkage of research and researchers on the one hand and practice and practitioners on the other.

Findings and Conclusions

1. The *favored model* consists of six stages, beginning with a research knowledge pool (stage I) and moving to broad practice use (stage VI). Each stage is connected by an operational step, the output of each step becoming the product base (stage) from which the next step proceeds. The five operational steps are given below (in italics), each step followed by its product stage:

(a) *Retrieval, Codification, Generalization:* Consensus Findings, Propositions.
(b) *Translation and Conversion:* Generalized Principles.
(c) *Operationalization:* Application Principles in Delimited Form.
(d) *Initial Implementation—Field Testing:* Practice and Policy Outcomes; Refined and Elaborated Application Principles; Diffusion Media.
(e) *Wide Diffusion:* Broad Practice Use.

The model may be identified as the *research, development, and diffusion* approach, as distinguished from the *social interaction* and *problem solver* models, although elements of the several models are intermingled in practice.

2. *Barriers to collaboration* between social scientists and practitioners include the following: (a) basic professional definitions; (b) value considerations; (c) communication difficulties; (d) methodological assumptions; (e) orientation toward clients; (f) interprofessional conflicts; (g) perceptions and attitudes.

3. *Roles* play an important part in determining the extent to which the practitioner will achieve actional effects through the application of social science knowledge. A variety of solution strategies for role conflict are employed. Practitioners have the capability to strongly influence community programs; they can play significant linking agent roles. Role orientations may be differentiated as between professional, bureaucratic, and client centered. Factors associated with political and activist roles have been identified.

4. A number of generalizations concerning the *organizational framework of social change* emerge from the literature surveyed. Environments affect and feed back on organizational structure and behavior. The nature of an organization's goals influences its effectiveness. Size produces effects via related considerations such as dispersion, hierarchy, and division of labor. Technology affects organizational considerations, as do the number and variety of professionals. Supervision and modes of power influence within organizations have a bearing on functioning and innovation. The place of paraprofessionals in an organization opens up a number of considerations affecting social change.

5. *Generalizations and accompanying action guidelines* are presented in the fields of (a) political and legislative behavior; (b) participation by voluntary associations and primary groups; (c) social movements, political action, and client organizations; and (d) the movement and assimilation of populations.

6. *Diffusion and adoption of innovations* may be considered in terms of population groups, as distinguished from organizations.

(a) Population, or target system variables associated with receptivity to innovation relate to the following factors:
  (1) Cultural values.
  (2) Socioeconomic status.
  (3) Past experience with innovations.
  (4) Felt need for change.
  (5) Value orientation.
  (6) Social participation.

(b) Attributes of the innovation proper that affect the diffusion and adoption process are:
  (1) Relative advantage.
  (2) Value compatibility.
  (3) Partialization.
  (4) Communicability.
  (5) Geographical accessibility.
  (6) Complexity.

(c) Attributes of the diffusion and adoption process include:
  (1) Compatibility of the diffusion process.
  (2) Communication media used by different categories of adopters.
  (3) Peer support.
  (4) Opinion leaders.
  (5) The innovation message.
  (6) The process of diffusion and adoption.

7. *Factors affecting innovations in organizations* are presented in terms of professional considerations and those related to organizational structure:

(a) Staff structure and the diversity of professional staff influence innovation. The adoption rate is related to:
  (1) The diversity of the organization's staff specialties.
  (2) Extraorganizational professional linkage interactions engaged in by its employees.
  (3) The length of professional training.
  (4) The number of professionals employed.
  (5) The functioning of professionals as opinion leaders for other employees.
  (6) Paraprofessionals as a source of organizational innovation, particularly with respect to making organizations more responsive to the needs of lower-income populations.

(b) Organizational structure relates to innovation in terms of factors such as the following:
  (1) Formalization.
  (2) Centralization.
  (3) Size.
  (4) Production emphasis.
  (5) Job satisfaction.
  (6) Joint programs.
  (7) Innovation in the application of research.

(c) Certain characteristics are associated with the effectiveness of organizations that introduce innovations in other organizations; for example:
  (1) The effectiveness of an "organization for innovation" is associated with organizing innovations into demonstration projects.
  (2) The effectiveness of an "organization for innovation" is associated with a decentralized administration that allows the staff to influence and stimulate others with a minimum of constraints on role performance.
  (3) The effectiveness of an "organization for innovation" is associated with having a staff that is particularly able to deal with the target organizations or clients for whom the innovations are intended.

8. Both intra- and extraorganizational factors may offer *resistance* or set up barriers to the implementation of an innovation, even after it has been formally "adopted." The converse of such factors as noted by Thompson (1965) is presented as follows, thereby reducing barriers to implementation:

(a) An absence of production ideology.
(b) Encouragement of conflict and uncertainty.
(c) The use of intrinsic rewards.
(d) Elimination of hierarchy through which an innovation must pass to win acceptance.
(e) Placing a high value on goal attainment rather than internal distribution of power and status.
(f) Nonsegregation of innovation units.
(g) Uncommitted money, time, skills, and good will.
(h) Ease of communication.
(i) A middle range of member identity, between total commitment and complete alienation from the organization.
(j) A psychological sense of personal security and autonomy, coupled with a moderate level of problem challenge and uncertainty.

CONTINUED

4 OF 5

(k) The general characteristics of "structural looseness" (broader participation in decision making, less stratification, use of group processes, temporary and rotating assignments, etc.)

9. In addition to collating generalizations from the literature and translating them into action guidelines, the author and his staff have prepared a *manual for implementation* that includes the following suggestions:

(a) Provide the research basis for an action principle.
(b) Convert the research generalization into its specific applied form.
(c) Provide an example showing the implementation of action guidelines with regard to a problem situation or practice context familiar to the practitioner.
(d) Select an example that is as close as possible to the practitioner's perspective, using practice language or the actual words of similar practitioners.
(e) Check to assure that the specific action principle contained in the narrative example is clearly and simply explicated.
(f) State the relevancy of the action guideline to the general practice outlook of the practitioner: his objectives, tasks, problems, needs.
(g) Provide definitions, qualifications and elaborations as appropriate to clarify or amplify the use of the action principle.
(h) Provide concrete practice examples of all elements of the guideline that have empirical refferents.
(i) Show various possible patterns of implementation of a given action guideline. These patterns represent different general modes of action within a common intervention strategy.
(j) Present, as an aid to the practitioner, possible problems ("pitfalls") in implementing the guideline.
(k) Offer useful avenues of attack ("tips").
(l) Convey a reasonable amount of encouragement, reinforcement, and optimism in order to give the practitioner a pushoff toward utilization and to facilitate use of the action guideline plus the manual. If possible, such encouragement should include legitimation from colleagues.
(m) Provide technical assistance with regard to taking the initial steps toward active implementation of the guideline in a practice situation.
(n) Structure an opportunity to take initial steps toward implementation.

230

PLANNED CHANGE: EDUCATION
Change strategies
Innovation adoption

ANALYSIS AND SUGGESTIONS

Rubin, Louis J. Installing an innovation. In R. R. Goulet (Ed.), *Educational change: The reality and the promise.* New York: Citation Press, 1968, pp. 154-165.

Purpose

"Neither restlessness, tinkering, nor frenetic activity make for genuine improvement. Change and innovation must be ordered by informed judgment, by the fruits of sound reasoning, and by a clear sense of the way things are." In this article the author proposes a system for installing innovations in ongoing organizations.

Method

The author has based his analysis on his own knowledge, experiences, and observations.

Findings and Conclusions

1. There are several weak spots in the current art/science of innovation installation.

(a) Most innovations that can make an authentic difference tend to necessitate personnel training, a phenomenon about which too little is known.
(b) The invention of innovations does not always parallel the needs of the system.
(c) Little is known about the degree and kind of preparation that should precede the introduction of an innovation.
(d) Innovations often enjoy fad status. The spotlight is therefore focused only on a small number of related innovations rather than on the many and diverse innovations being put forth in different areas.

2. The change process consists of four phases: *research, development, dissemination,* and *installation.*

3. Rubin hopes that schools will come to view innovation as a necessary but insufficient part of improvement. He asserts that "There must be a rational effort to capitalize on the new, but there must be an equally rational effort to search out the inadequate and to apply correctives, even if the correctives are 1, 5, or 10 years old."

4. Effective installation of an innovation involves three sequential phases: Preliminary analysis, strategy selection, and action.

(a) The *preliminary analysis* operation consists of four steps: Diagnosis of a weakness, analysis of the responsible factors, comparison of alternative correctives, and selection of the best corrective. This analysis serves several functions:
  (1) It creates a bridge between the introduction of an innovation and the improvement or change in the system.
  (2) It yields clues for the strategy selection and action operation.
  (3) It provides a partial basis for determining which of the available innovations is most appropriate for prevailing conditions.
(b) The *selection of strategy* is based on consideration of the kind of innovation being installed, the characteristics of the organization or target environment, and the individual engineering the change.
(c) The *action* phase requires seven steps:
  (1) Analyze the training, materials, and linkage requirements necessary to incorporate the innovation into the existing system. The staff must understand the innovation, its requirements, and its relation to the school's objectives.
  (2) Initiate motivating pressures through inducing dissatisfaction and illuminating rewards. The benefits of the innovation must be clear.
  (3) Initiate the influence strategy. Specific strategies must be used to induce the staff to accept the innovation.
  (4) Initiate preparatory activities. A "getting ready" program must be provided.
  (5) Introduce the innovation.
  (6) Support the transition from old to new. Various kinds of support must be provided in order to prevent premature or transitional failure.
  (7) Link the innovation to the permanent system; the innovation must be tied to the overall program.

231

PLANNED CHANGE: HEALTH
Organizational factors
Consultant role

CASE STUDY ANALYSIS

Rubin, I., Plovnick, M. and Fry, R. Initiating planned change in health care systems. *Journal of Applied Behavioral Science*, 1974, 10, 107-124.

Purpose

"To stimulate readers to question their general assumptions about client-consultant relationships in the initiation of planned change" and "to identify the forces at work when one tries to initiate planned change programs in community health organizations."

Method

Reflection on recent experiences (including analysis of one case) arising during efforts to be a helpful consultant to community health organizations.

Findings and Conclusions

In contrast to organization consultation procedures which commonly focus on the "middle stages" of diagnosis, planning and action, work with community health organizations demands more time spent on "initial stages" of scouting and entry.

While the clients in this study were well aware of serious needs for change and of their need for help, the degree of resistance was surprising. The task of health care is less easily defined and measured than is industrial production. Life and death issues make the ambiguity and frustrations less tolerable than are those of other organizations. Hence, health care organizations often demand proof in advance of the presumed benefits of a change. They are no more disposed to try "team building" than they would be to experiment with a new and unproven medication. A medical maxim is "primum non nocere" (first, do no harm). Medical practice may involve the patient little or not at all; the doctor diagnoses and prescribes. It tends to be oriented to treatment of a disorder rather than to prevention. Emerging crises continually take precedence over meetings for study and planning.

The role of an administrator in a community health center is especially difficult. If he is not a physician he is often subordinated to the M.D.'s. Feedback is limited usually to the response of patients to treatments and seldom recognizes organizational achievements. Further, there is no ladder of advancement up which he can hope to move. He must cope with multiple power structures to get funds, provide good technical services, and please the community. Bringing conflicts out into the open is seldom good politics or effective in raising money.

A consultant who wants to help health care organizations will need to change his self-image as a resource to permit him to initiate, to "sell" himself to skeptics, to get more closely involved in the day-by-day work of the agency, and to offer more persuasive communications.

232

DIFFUSION PROCESS
Innovation: agriculture
Adoption factors

EMPIRICAL STUDY

Ryan, B., and Gross, N. C. The diffusion of hybrid seed corn in two Iowa communities. *Rural Sociology*, 1943, 8, 15-24.

Purpose

This study was designed to trace the diffusion pattern of an innovation (hybrid seed corn) among farmers.

Method

The authors interviewed "practically all of the farm operators" dependent on two rural town centers in Iowa. Included in the sample were 323 farmers.

Findings and Conclusions

1. Noting that the adoption of this corn variety required few changes in routine and farming equipment, the authors found that it still took roughly five years for the first adoptions to occur after the farmers had their first knowledge of the product. After initial adoption by a few farmers there was an increasing acceptance rate among other farmers.

2. The authors point out that those farmers who tried the innovation first insisted upon personal

experimentation before complete acceptance, but that this experimentation period shortened considerably for later adopters.

3. Almost one-half of the farmers interviewed cited personal contact with salesmen as the earliest source of information, while an additional 10 percent named radio advertising. About 15 percent named neighbors and another 11 percent named farm journals as their original source of information. Farmers who heard of hybrid seed corn late in the game were more apt to hear from neighbors.

4. There appeared to be two forces at work: introductory mechanisms and activating agents. While professional salesmen served the introductory function, neighbors were the most influential in activating the adoption of the hybrid corn.

233

ORGANIZATIONAL FACTORS
Innovation: business
Adoption characteristics

EMPIRICAL STUDY

Sapolsky, Harvey M. Organizational structure and innovation. *Journal of Business*, 1967, 40, 594-610.

Purpose

Sapolsky's investigation was directed toward differentiating between organizational and individual innovation.

Method

SAMPLE

Using department stores as a focal point for his study, Sapolsky examines the innovation experience of nine of the most innovative* firms in the East and Midwest.

DATA

The main source of data for the study was a series of open-ended interviews conducted in 1965-66 with management personnel of these organizations. One of the main objectives was to determine the origins of proposals for organizational changes. A general interview guide was followed throughout the fieldwork.

The innovations studied were: (1) the separation of buying and selling function; (2) use of electronic data processing in merchandise operations; and (3) use of decision-making techniques such as PERT and operations research to merchandise problems.

BACKGROUND THEORY

Factors that increase the probability that organizational participants will devise and present innovation proposals are precisely those factors that decrease the probability that the organization will adopt the proposals. The stimulation of potential innovation is distinct from and even antagonistic to the stimulation of the adoption of the innovation. The diversity of an organization's incentive and task structure affect the rates at which an organization will generate and adopt innovations. Diversity affects all three stages of organizational change—the conception of possible change, the proposal of change, and the adoption of change.

HYPOTHESES

1. The greater the diversity of the organization the greater the probability that members will conceive and propose major innovations.

2. The greater the diversity of the organization, the smaller the proportion of major innovations that will be adopted.

Findings and Conclusions

1. The author found that the innovations studied were highly interrelated, and that the adoption of one might be expected to lead to or facilitate the adoption of others.

2. The proposals of the changes originated with, and were supported by, personnel in similar positions in each of the stores. These were the store controllers who were found to have close relationships with controllers in other firms. These controllers often met at professional conferences of controllers, and prestige went to the controllers who had gained the greatest participation in store man-

*The basis for selection of these innovative firms is no more specific in the original article.

agement and who had applied the newest techniques.

3. The innovation proposals had not been widely implemented. While differences in internal politics, personalities, and expectation of innovational costs and benefits led to somewhat different results in each firm examined, a general pattern of presentation, experimentation, and frustration related to structural arrangements can be discerned.

4. The decentralized structure of the department store is viewed as a major barrier to the institution of the change. The author sees the tactics that facilitate initial application to be in conflict with diffusion within the same organization, citing the fact that interunit communication is usually so good within an organization that tactics used with one sector are likely to be spread in other departments, in many cases developing rather than overcoming the resistance factor. The author concludes that the diffusion of innovation becomes difficult, expensive, and sometimes, impossible, in firms composed of a large number of equals who demand equal treatment.

5. Sapolsky felt that the data from the department stores supported the hypotheses concerning diversity and innovation.

234

CHANGE PROCESS
Change models
Linkage functions

ANALYTICAL MODEL

Sashkin, M., Morris, W. C., and Horst, L. A comparison of social and organizational change models: Information flow and data use processes. *Psychological Review*, 1973, 80 (6), 510-526.

Purpose

The paper analyses five models of social and organizational change by examining the way each model deals with the generation and flow of information in the production of change, and with the role of change agents in the application of each of the models.

Method

Based on an analysis and synthesis of the literature, the authors have chosen five change models that, in their view, are most significant with respect to both the theory and the application of behavioral science. For each model the analysis presents:

1. Its basic assumptions regarding data generation and information flow.
2. The key questions the model poses for those who apply it.
3. An example of a possible or actual application.
4. Problems regarding the validity and use of the model.

In addition, the tasks and roles of change agents implicit in the application of each model are treated.

Findings and Conclusions

1. The five selected models are designated as follows:

(a) Research, development, and diffusion model.
(b) Social interaction diffusion model.
(c) Intervention theory and method.
(d) Planned change model.
(e) Action-research model.

2. Although similar in some respects, the models differ significantly in others.

(a) Differences in *assumptions* refer to such matters as:
  (1) The generation of new knowledge.
  (2) Degree of involvement or passivity of users.
  (3) Necessity of the consequences of rational procedure.
  (4) The location of needed data in external research versus within the client system.
  (5) The role of the linkage network.
  (6) The utilization of available data.
  (7) The need to translate data into action steps.
  (8) Mechanisms for stabilizing changes.
  (9) The continuity of data collection follow-

ing changes.

(10) Stress on process of acquiring and utilizing change data versus specific changes themselves.

(11) The generalization of change potential sought.

(b) Questions such as the following may be directed at one or more of the models:

(1) How can the "disseminator" adequately identify the user population?

(2) How can the disseminator select the communication medium, method, and time most likely to result in user acceptance?

(3) How can "opinion leaders" or "gatekeepers" be identified and used to channel information?

(4) How can the interventionist remove blocks, add linkages, and support information flow?

(5) How can he promote use without exerting major influence over decisions, choices, and outcomes?

(6) How does the change agent determine what data are relevant?

(7) How does he gather and present these data to the client?

(8) How does he create commitments for the continuation of the change made?

(9) How does the action researcher design data collection and action experiments so as to relate to the specific problem of the client?

(10) How can he demonstrate the continuous nature of the action research process?

(11) How can he provide the client with the skills needed to keep the action-research cycle going?

(c) Examples can readily be found to illustrate each of the models. These are presented in the report.

(d) Each of the models raises certain problems regarding its validity and usefulness, such as the following:

(1) The *research, development, and diffusion model* has been characterized as being excessively research oriented and insufficiently user oriented, and as ignoring major aspects of the actual communication process. Research on the model is said to have been attempted rarely.

(2) The *social interaction diffusion model* is considered to have dealt inadequately with changes in organized social systems and to have regarded the user or the user system as a passive consumer.

(3) The *intervention theory model*, while its assumptions generate testable hypotheses, is regarded as not having been based on research evidence. Research is used more as a client-training process.

(4) The *planned change model* is described as emphasizing specific problems and changes rather than the change process. While grounded in theory and research evidence, it is noted as placing little stress on research measurement or evaluation of results.

(5) The *action-research model* requires the change agent/researcher to play somewhat confusing multiple roles. Considerable commitment and effort is required on the part of the client. The model is focused on the process of change rather than specific changes, thus requiring a matching set of tools to implement specific changes.

3. The models may be compared with regard to the change agent activities they emphasize.

(a) The consultant role is common to all models, with variation in the use of sources of data.

(b) The training function applies primarily to the last three of the listed models.

(c) The research function ranges from nonapplication in the first listed to considerable application in the last, with increasing degree of probability in the case of the middle three.

4. The knowledge linkage functions of the change agents with respect to the several models may be expressed in terms of the consultant, training, and research roles mentioned above. The detailed operation of linkage functions are depicted in a schematic representation showing the relationship of the applied behavioral scientist to the three types of activity and to knowledge resources of external behavioral science and of the field of knowledge of the client system.

5. While none of the models is all-complete or conclusively validated, each one has its place in the matter of facilitating information flow and use. Nevertheless, the authors favor the action-research model as being most complete and as adding most to our knowledge about the change process and problems of change.

6. Three significant areas of research are suggested:

(a) A comparison of models: a comparative analysis of the effects and the effectiveness of the five models in similar and different situations.

(b) Change agent roles: an examination of the three change agent roles (consultation, training, and research) and the three linking activities (helping the client evaluate the effects of knowledge use, evaluating the total process of change, and linking the knowledge obtained to professional knowledge banks). (The latter may be designated as input, output, throughput.)

(c) Role operationalization: research in the validity of individual and team operationalization of the three roles.

Illustrations are presented as to how research in each of the three areas might be conducted.

235

CHANGE PROCESS: SOCIAL
Consultation measures
Individual reeducation

EMPIRICAL STUDY

Schindler-Rainman, E., and Lippitt, R. *Team training for community change: Concepts, goals, strategies and skills.* Riverside, Calif.: University of California Extension, 1972.

Purpose

The authors describe a project where university extension classes were used as the medium for creating and training "community change teams." Social change teams were made up of professionals, paraprofessionals, and volunteers from the community working together to effect social change in specific problem areas. In the developmental work and in research, the consultants sought ways to create the conditions for participation and learning that would stimulate motivation, commitment, skill and successful action initiatives on significant problems in government agencies, in local organizations, and in the community itself.

Method

The booklet describes the project first as a case history, relating how the consultant, Eva Schindler-Rainman, was originally contacted and how she and others developed the idea of using the facilities of the Extension Division, University of California, to catalyze social change in the community of Riverside. Social change training was conducted by professional consultants and paraprofessional trainers during regularly held social change classes. Participants were recruited from employees of local agencies, from volunteers in local organizations, and from leaders in the local community. They were grouped into teams, each of which selected a social change project related to a specific problem within or between organizations (e.g., lack of communication between parole agencies and job placement agencies). Social change training consisted of guidance and feedback from professional trainers, interaction among team members, and consultation between or among teams.

Findings and Conclusions

1. Certain social change training methods were found to increase the effectiveness of individuals and teams as agents of planned social change in their local community:

(a) Participative learning; that is, providing participants with the opportunity to help plan the social change course and decide the activities and issues to be dealt with.

(b) Providing constant feedback channels between team members and trainers and across teams. This permitted team members to benefit from consultation on the way the team was working together and, where the teams worked well together, permitted team members to use each other as resources (for particular skills, contacts, etc.).

(c) Providing behavioral skills such as role-playing, anticipatory practice skills (during which individuals and teams attempted to imagine the responses, values, and feelings of others),

selection of goal priorities, and exploration of goal feasibility.

(d) Providing a concrete setting (i.e., a real problem situation as perceived by team members) as the context for practicing social change skills.

2. As measured by individuals' increased capacity to work within their teams and the teams' increased capacity to work with each other, the social change training project succeeded.

3. As measured by changes which the teams reported making, the training was found highly effective. Twelve of the 18 teams reported full implementation of their change goals.

236

KNOWLEDGE UTILIZATION: EDUCATION

Individual reeducation

Researcher-practitioner relationships

ANALYTICAL MODEL

Schmuck, Richard. Social psychological factors in knowledge utilization. In T. L. Eidell and J. M. Kitchel (Eds.), *Knowledge production and utilization in educational administration.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1968, pp. 143-173.

Purpose

A theoretical analysis of problems of knowledge utilization in education, and suggested programs for facilitating research utilization.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. *The social relationships between the behavioral science researchers and the administration impedes utilization in three ways:*

(a) The ingroup, outgroup phenomenon found in studies of prejudice often characterized such a relationship.

(b) The developing stereotypes are reinforced by lack of communication, and hostility is increased by challenge of each other's intelligence and status.

(c) Vicious cycles involving inadequacy and withdrawal as well as hostility and resistance can characterize the researcher-administrator relationship.

2. *Along with these difficulties in interpersonal relations there are a cluster of four detrimental psychological processes:*

(a) Both parties collectively perceive aspects of the other's behavior to the detriment of the relationship.

(b) Distortions of memory, especially concerning the feelings of the other, characterize the relationship.

(c) There is a tendency to place low value on each other's work.

(d) The possibilities of collaboration may seriously threaten the self-concepts of both.

3. *For the administrator, internal psychological linkages between knowledge and practice are made difficult by:*

(a) Role expectations others hold for him.

(b) His own division between the role of administrator and the role of learner.

(c) The lack of clear operational goals.

(d) His lack of motivation to try something new.

(e) Presentations of the research knowledge in strictly verbal ways and in moderately threatening surroundings.

4. *There are ten social psychological assumptions that must be considered in planning action to facilitate research utilization:*

(a) There must be trust, openness, and attraction between the administrator and the behavioral scientist if there is to be effective communication.

(b) Cooperation activity should be structured so that each will benefit directly from it.

(c) At the start of any collaboration, there should be a discussion of the forces that might inhibit either side's participation. a public discussion of restraining forces and how they might be overcome is important in unfreezing both parties.
(d) The superordinate goals that transcend subcultural differences should be discussed and agreed upon by researcher and administrator.
(e) The administrator's values and goals should be sharpened and more clearly defined during the knowledge utilization process.
(f) An operational statement of goals should be encouraged along with measurement. The first practice in using research should be through simulating; next should be through fantasying behavior; next should be through feedback from tryouts and subsequent action on feedback.
(g) Following simulation, actual tryouts should be encouraged with support from a seminar group of other administrators.
(h) Because of a reciprocal role involvement, it may be necessary for the entire school staff to be involved in learning how to handle the change.
(i) The administrator should receive training on how to give and receive feedback.
(j) The administrator should receive training in flexibility and open-mindedness.

5. *The following ten stages should be present in the design of a training program for the development of an individual administrator:*

(a) There would be some sort of T-group experience to help administrators become more reflective about their own behavior and to impress upon them that their behavior, and not thoughts and values, affects the feelings and reactions of those who work with them.
(b) Behavioral science knowledge relating to some aspect of administrative practice would be presented, discussed, and its use set up as an important objective.
(c) Administrators would become acquainted with diagnostic skills related to their domain of behavioral science. For example, an administrator could be taught how to measure the effects of his leadership behavior.
(d) Brainstorming fantasy sessions would be used to help each administrator think through specific ways in which he could behave in attempting to implement given research findings.
(e) Various role-playing scenes would be used to try out practices and to get immediate feedback.
(f) Skills in giving, receiving, and using feedback would be discussed.
(g) Administrators next would be asked to make commitments to try out some of these practices in their school settings. Analysis would be used to identify facilitating and restraining forces in their situations. In order to maximize commitment, the administrator would record on tape the thoughts he has about the practices he will try in his administrative role.
(h) At a later session the tape would be played back; if the commitment was unrealistic, changes can be made.
(i) The administrator would use a questionnaire and collect verbal feedback on the effects of his practice.
(j) During the period of trial, group discussions would be held with fellow administrators.

6. *The next design concerns eight stages for modifying the faculty's expectations and pressures that support the status quo:*

(a) An organization training experience involving the entire faculty would come early in the program to help them open up to more analytical, skillful, and interpersonal relationships, etc.
(b) Behavioral science knowledge on school staff processes would be presented and discussed.
(c) Diagnostic skills from the domain of behavioral science would be discussed and the group would learn more about group processes; for example, decision making.
(d) Brainstorming would lead to suggestions for specific changes in staff procedures.
(e) There would be a trial by all the staff of the new procedures with a panel observing the trial in action and giving feedback.
(f) In connection with the above, skills in giving, receiving, and using feedback would be provided.
(g) After the trial period the staff would be asked to make comments to continue the most effective new procedures.
(h) A panel of staff members would continue to collect data about the effects of the new procedures.

237

RESEARCH REPORTING
Communication media

ANALYSIS & SUGGESTIONS

Schoenfeld, Clarence A. Communicating research findings. *Journal of Educational Research,* 1965, 59(1), 13-16.

Purpose

The author feels that the poor quality of written research reports is a primary factor in the communication breakdown between researcher and user. This article offers some suggestions and guidelines for upgrading the quality of the written research report, in the hope that better lines of communication between researcher and user can be established.

Method

The ideas in this article are based on the broad experience and observations of the author.

Findings and Conclusions

1. In preparing the research report, the researcher must consider the relevance of the content to the larger field of inquiry or practice.

2. The subject should be reduceable to one paragraph.

3. The audience for whom the information is relevant should be carefully delineated and then in accordance with the audience analysis, the medium, occasion, etc., for the appearance of the article should be determined.

4. IDEAS is the key word for the writer to keep in mind.

*I*ntroduce.	Make audience aware and interested.
*D*emonstrate.	Show some connection between the reader and message.
*E*xplain.	
*A*pply.	Give practical examples, suggested applications.
*S*ummarize.	Recap ideas for the intended audience.

238

INNOVATION: TECHNOLOGICAL
Organizational factors
Attitude toward change

ANALYSIS

Schon, D. A. *Technology and change: The impact of invention and innovation on American social and economic development.* New York: Dell, 1967.

Purpose

1. To examine the process and problems of technological innovation in the industrial corporation, within industries, and in American society as a whole. Schon discusses misconceptions of the process of change and makes his own general observations, citing innovations in many different industrial contexts. Many problems and processes of change recur, not only from industry to industry but also from level to level, from the research department of a company on up to national policy levels.

2. To discuss the role of government in innovation in America. Some industries do their own research and development; others depend upon the government for direction and/or financing. The situation varies from country to country, and governmental participation in the process of innovation has both helpful and harmful effects.

3. To advocate the ethic of change. Schon contrasts attitudes towards innovation which people

have held since before Socrates, at least. He contrasts two views, the "stable reality" view of Parmenides and the "reality is change" view of Heraclitus. Only by seeing innovation as a way of life, the author maintains, can we cope with our rapidly changing environment.

Method

The author draws on his experience in industry and government, where he dealt with administrative and policy aspects of innovation. He presents theoretical notions through cases and examples, sometimes historical, sometimes diagrammed. The author quotes from other sources, many of them outside the industrial context. Although Schon does present research findings, particularly when examining three industries' propensities to innovate, he aims the book more at the layman than at the academic.

Findings and Conclusions

1. Invention is essentially a nonrational process, and rational research planning, though necessary, often stifles creativity. Schon calls innovation "a confrontation with uncertainty requiring leaps of decision." Planning at its best is a way of living with uncertainty; so it should be flexible.

The corporation is ambivalent about innovation. On the one hand innovation is one of the greatest strengths of American industry, and the spectacular rise of R&D in major companies shows the attraction which innovation has. But many successful ventures are the institutionalizations of innovations, not of the process of innovation, which often poses a threat to the social structure of the corporation. The social system within a corporation attempts to maintain a stable state; this effort is not inertia but dynamic conservatism. The crisis of modern industrial corporations is that they are also required to undertake technical change destructive of their stable states in order to survive.

A "Drama of Corporate Innovation" ensues within the corporation. Innovation faces both interpersonal and interdepartmental obstacles. The boss sees the need to innovate and calls upon his subordinates for new ideas. They submit them; he judges them. The subordinate is given responsibility but no authority to innovate, and the subordinate will tend to present his safest—rather than his most original—ideas. Conflict between marketing and R&D departments often impedes the process of innovation. The artificial division between marketing and technology prevents the real work of invention. Fear of failure and professionalism isolate the two functions from each other. Each proposes ideas for the other's disposition or seeks to leave the other with the full burden of uncertainty. Thus the corporation unintentionally minimizes innovation. The strategies it has developed to control uncertainty increase the probability of failure.

Schon also presents an economic view of innovation on an industry-wide scale. He shows that innovation within the textile industry, for instance, is quite limited, because the individual firms are too small to support research and development. Consequently most new developments come from outside the industry, i.e., from related, feeder industries such as chemicals.

2. In some countries (like Japan, Russia, or Britain), the government is a leading participant in technical innovation. In the United States, on the other hand, the government tends to set rules and policies which affect innovation and only rarely (as in the Manhattan Project) participates in technical innovation. Schon advocates a systems view, where government would take a leadership role. It would (a) collect data, (b) interpret the data to determine the possible effects of alternative courses of action, and (c) make decisions, set policies, and manage the process of innovation as it manages the economy (by adjusting parameters and molding the environment in which innovation takes place).

3. In the Introduction, in Chapter V, and in the last chapter of the book, Schon explains and evaluates two postures towards change. The first he identifies with "the conventional wisdom" and with the views of the Greek philosopher Parmenides. Here change is a series of transitions from one stable state to another. A new invention takes over and establishes a new, stable market. A new leader rises to the top of a stable organization. Schon advocates a second, contrasting view, which he traces to the philosopher Heraclitus. Only change is constant; we cannot stick our feet into the same river twice. A new device makes older ones obsolete—but it too will be made obsolete by newer devices. Schon also discusses interpersonal processes and forms of organization which encourage experimentation. A "here and now" approach in an organization involves replacing the often stultifying corporate myth and terrifying striving for the perfect state of affairs with a more invigorating emphasis on process.

239

RESEARCH UTILIZATION: SOCIAL

Researcher-practitioner gap
Change agent

ANALYSIS

Schwartz, David C. On the growing popularization of social science: The expanding publics and problems of social science utilization. *American Behavioral Scientist,* 1966, 9(10), 47-50.

Purpose

To analyze the problem of social science utilization and to suggest a means of improvement.

Method

The article is analytical in nature and based on the author's knowledge and experience.

Findings and Conclusions

1. The effective utilization of social science research will increase when more efforts are made to generalize the findings to more and broader publics, and when researchers make better attempts to communicate with a variety of audiences, simultaneously at several different levels of sophistication.

2. Three publics for research findings are defined: (a) *the scientific community,* (b) *social action professionals and volunteers,* such as social workers, public health officials, etc., and (c) *students.*

3. The problems of utilization stem primarily from sins of omission and commission.

(a) *Sins of omission* are those resulting from the communication gaps between researcher and user. Relevant information doesn't get to the audiences that could make use of it.

(b) *Sins of commission* are those resulting from errors of fact and/or misinterpretation. Incautious generalization of findings beyond observed limits, bounds, and domains of discovered relationships can lead to program failures which in turn can cause negative backwash when the policies so based fail.

4. *The Popularizer Role*—the solution to a communication problem between researcher and practitioner is the development of a popularizer (knowledge linker) role. Such an individual would be "trained as and by social scientists and employed by various publics." Such an individual could serve as a crucial, continuing communication link. It would be a difficult role to fill. The author stresses the importance of topnotch training for such individuals to guard against further sins of commission.

240

ORGANIZATIONAL CHANGE

Organizational climate
Evaluation procedures

CASE STUDY-ANALYSIS

Seashore, S. E. and Bowers, D. G. Durability of organizational change. *American Psychologist,* 1970, 25, 227-233.

Purpose

This article addresses the general question of whether organizational changes that have been planned, successfully introduced, and confirmed by measurements over a relatively short time can survive as permanent features of the organization.

The article includes: (1) a review of the organizational change program introduced, (2) a descrip-

tion of the present state of the organization, and (3) speculation about the meaning of the data for the understanding of psychological and social phenomena in formal organizations.

Method

The authors, who had studied the organizational change program for two years as it was being carried out, returned to the company 4½ years later for a follow-up *post*-measurement. This remeasurement consisted of a one-day visit to the plant by a research assistant who administered questionnaires to managers, supervisors, and a sample of the employees. Also, some information was taken from the firm's records, and the views of the plant manager were solicited regarding the changes that had taken place and possible reasons for these changes.

Findings and Conclusions

1. *The organizational change program.* The program was instituted at a time when the company, suffering from fiscal instability, production loss, and negative employee attitudes, was taken over by a financially successful firm. The aim of the organizational change program was to move from a highly centralized, authoritarian system toward a participative system, with high value given to individual and organizational development, linking of the social system to the work system, and effective task performance. Change was to be introduced simultaneously at the situational, cognitive, motivational, and behavioral levels so that each would support the others.

2. *The present state of the organization.* The authors review the results of their study in the following areas:

(a) *Job attitudes.* In general, early improvements in employee attitudes were either maintained or improved. Seven of nine indicators of job attitudes were favorable; the authors give possible reasons for apparently adverse findings with regard to employee satisfaction with supervisors (increased responsibilities for supervisors, resulting in role changing from a peerlike to a superior status relationship), and for the decline in the proportion of employees planning to stay on indefinitely (many short-term employees hired; rising prosperity during the period, resulting in an increase of female terminations).

(b) *Task-orientation.* The data indicated a rise in the level of task orientation and production concern since the end of the formal change program.

(c) *Supervisory leadership behavior.* The organization had increased its expression of concern for production goals and for provision of conditions for effective work performance at no cost of declining concern for employee attitudes and satisfactions.

(d) *Hierarchical* distribution of control. The data indicate a change of modest degree in the amount and distribution of control exercised, including increments for lower-rank people. There had not been a reversion to the original condition of concentrated control at the top.

(e) *State of the organization as viewed by supervisors and managers.* Using Likert's "Profile of Organizational and Performance Characteristics," the data indicated a pattern of change substantial in magnitude and wholly compatible with the intentions embodied in the change program. The organization had indeed progressed toward its ideal of a participative organizational system. The company also showed an increase in profitability.

3. *Implications.* Three possible explanations of the successful change program are offered as a guide to similar endeavors in the future:

(a) One important idea in the program was to make structural changes in the organization that matched the work system and did not violate reasonable assumptions about the values and motives of individual workers. It was important to view the factory as a total system. Hence, the authors suggest, the interdependence of elements tends to preserve, to enhance, and to "lock in" the central characteristics of the system and thus to prevent retrogression.

(b) Another factor contributing to the continuing atmosphere of change was that of early legitimation of concern about organizational processes. The authors note: "An organization habituated at all levels to think about, discuss openly, and to weigh properly the full range of elements in the organizational system might well have unusual capacities for self-maintenance and self-development."

(c) Finally, the authors speculate that the atmosphere of change (aside from the company's acquisition by another firm) may be attributable to the inherent merit of the participative organizational model itself.

241

RESEARCH UTILIZATION
Utilization measures

CASE ANALYSIS

Shartle, Carroll L. The occupational research program: An example of research utilization. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science* (Vol. 1). Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 59-72.

Purpose

The author describes the occupational research program as an example of research utilization and then explores some of the major factors related to utilization.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

The most enlightening part of this article is the author's discussion of the factors that facilitated utilization of research findings.

1. *Dual responsibilities of the researcher*—the researcher unit was given responsibility for both development and application.

2. *Developing informal relationships with operating people and filtering technical people into operating offices*—research and utilization personnel from the project were filtered into related agencies to provide assistance with products and materials resulting from the occupational research program.

3. *Institutionalizing the change agent role*—individuals who essentially functioned in a change agent role were placed in regional offices to give assistance. Their efforts were directed mainly toward persuasion.

4. *Research participation by lay persons who later aided in utilization*—individuals involved in the planning of the program were convinced of the importance of research and its potential value in the operating picture. They were able to facilitate utilization through influencing decisions in the operational context.

5. *Formal in-service training*—training sessions incorporating previously planned teaching aids and practical exercises proved invaluable in facilitating research utilization.

6. *Required use*—one of the most effective means to insure utilization of materials produced by behavioral science research is to require their use and to give credit for such use.

7. *Format and content of research product must be appropriate*—research findings and products must be available in usable form; otherwise, application and utilization will be limited.

These were the factors that the author felt most influential in facilitating research utilization during the 20-year operation of the occupation research program.

242

KNOWLEDGE UTILIZATION
Information needs
Linkage functions

SURVEY OF LITERATURE

Short, E. C. Knowledge production and utilization in curriculum: A special case of the general phenomenon. *Review of Educational Research*, 1973, 43, 237-301.

Purpose

1. To discuss the relation of research to practice.

Short describes the mismatch between the knowledge produced by researchers and the knowledge

required by practitioners. He presents a new view of the problem, Knowledge Production and Utilization (KP&U), which departs from the "research into practice" framework and investigates the complex interrelations of production and utilization.

2. To survey the study of knowledge production. More work has been done on the production aspect of KP&U than on either the utilization aspect or the relationship between production and utilization. Short reviews studies of how much is known about knowledge production, the quality of that knowledge, and the different kinds of knowledge. He discusses the four basic roles associated with knowledge production and the methods of inquiry of this aspect of KP&U.

3. To survey the study of knowledge utilization. The author discusses the problem of access to knowledge and some information transfer mechanisms which have been tried. He discusses a new conceptualization of the knowledge transfer process.

Method

This paper surveys the general literature on knowledge production and utilization and explains how this field differs from more pragmatic approaches. It deals with three domains of interest: knowledge production, knowledge utilization, and the relation between the two. The author examines each domain of interest from three perspectives: studies related to KP&U in general, studies related to education in general, and work more specifically related to curriculum. He provides an extensive bibliography, encompassing all three perspectives.

Findings and Conclusions

1. *Viewing the relation of research to practice.* The use of research to improve practice is frequently taken for granted. Although researchers are becoming less cavalier about the usefulness of their work, still the commonsense view persists that the knowledge sought by the practitioner is the same as that which can be provided by the researcher. Men do not change their minds on the basis of specific findings or knowledge; rather they gradually shift their views, following long-range, indirect contributions of theoretical research to the understanding of behavior. Researchers should try to understand the complex ways knowledge is used in practice. Most knowledge appropriate to the circumstances of practice seems to derive from a particular area of practice. But the relationship of research to practice is not one-to-one; rather it appears to be a process involving a series of complexly interrelated steps, still only partially understood.

A new way of looking at the KP&U problem is less concerned with the pragmatic impact of research on practice and more concerned with the dynamics of KP&U as a recurring process.

2. *Surveying the study of knowledge production.* The author cites the general need for increased knowledge production. In today's postindustrial society, considerable theoretical knowledge is required as a guide to practice. But only the grossest estimates are available as to the quantity of knowledge which is being produced. This information would be useful in policy formulation.

More is known about the quality of knowledge than about the quantity being produced. More still is known about the social organization of knowledge producers and the effect of various characteristics of such organization upon productivity. Mechanisms internal to scientific organizations that are used to affect productivity of member scientists include: (a) maintaining intellectual and value norms for scientific work, (b) conferring of status and access to intramural communication networks, and (c) advancement to more favorable positions and offices within research structures. Also, certain kinds of knowledge production are not prestigious and are therefore not strongly supported. The author surveys several ways in which kinds of knowledge are differentiated and classified.

Different kinds of knowledge also result from the different roles of the producer. What was once thought to be one role—the researcher, producing one type of knowledge—has come to be recognized as a series of differentiated roles each contributing to a different type of product. The author describes four basic roles in some detail.

(a) The *Researcher*: this traditional role needs little explanation. Short gives many examples of research in the disciplines of education and curriculum.

(b) The *Integrator*: This role is also known as the synthesizer or interpreter. It involves relating and generalizing of findings of a large number of specific basic or applied research studies.

(c) The *Translator*: This role is also known as developer, educational engineer, inventor, or designer. The person in this role identifies particular operational problems and invents solutions by transmitting, translating, or transforming already existing solutions, by

synthesizing solutions from known but previously uncombined components, or by creating solutions *de novo*.

(d) The *Knowledge Linker*: This is the diffusion role, which bridges the knowledge gap between researcher and practitioner. These roles are not mutually exclusive. The author gives examples of each in education and curriculum.

Different kinds of knowledge and different knowledge producer roles require different methods of inquiry. After surveying several typologies of inquiry in education, Short discusses four types of inquiry in general: (a) *Disciplinary* inquiry differs in form from field to field; that is, each field has procedures which it considers appropriate at each stage of the process. (b) *Conjunctive* or multidisciplinary inquiry studies one problem as a "whole" and produces an end-product which weaves relevant findings from a number of separate studies in various disciplines into a conceptualization of the "whole." It differs from other approaches in that it neither studies the problem as an abstract question suitable for investigation by methods of a particular discipline nor produces a practical product (necessarily) from many perspectives. Short does not know of any charted methods for this type of inquiry, but he cites several examples of studies using this approach. (c) *Technological* inquiry develops a set of actions or procedures which can be shown to have a particular effect. It entails these activities: depicting, inventing, fabricating, and testing. Short surveys several descriptions of technological inquiry from industrial, social, and professional sources. (d) *Inquiry for Practice Theory* is discussed as an addendum to the other three types. Practice theory deals with particular situations in practice and is not generally thought of as being amenable to generalization. Short says that this subject of inquiry should have its own methods and discusses sources from which a general approach would derive.

3. *Surveying the study of knowledge utilization.* Production of knowledge and its availability for use are not in themselves sufficient conditions to assure that it will be utilized. The author treats several other aspects of the problem, making reference not only to studies which have been undertaken but also to organizations which have been created to transfer information. The first aspect is access to knowledge. To assure that knowledge does not remain confined to the community where it originated, various systems have been created. Short describes information analysis centers in education.

The second aspect of the knowledge utilization problem deals with information needs and uses. Short reviews the critical literature, including both general and educational perspectives. The third aspect deals with what Havelock calls "the science of knowledge utilization." This approach to knowledge utilization attempts to understand and relate all aspects of the phenomenon of knowledge utilization in its most general sense. The knowledge transfer process is conceived as a linkage process between a user and a resource, and also as a knowledge flow system which links several of these transfer processes into a system. Knowledge utilization is revealed as a complex process, involving the user's internal knowledge structure, his motivation, his estimate of the source's credibility, the social sanctions that exist for or against use, the availability and appropriate form of knowledge, and the existence of linkage agents or systems.

243

ORGANIZATIONAL FACTORS
Innovation: education
Change strategies

ANALYTICAL MODEL

Sieber, Sam D. Organizational influences on innovative roles. In T. L. Eidell and J. M. Kitchell (Eds.), *Knowledge production and utilization in educational administration.* Eugene, Ore.: Center for the Advanced Study of Educational Administration, University of Oregon, 1968, pp. 120-142.

Purpose

The author identifies four features of our public education system that distinguish education from medical practice, industry, and agriculture, and

thus affect the applicability of diffusion research in these fields to education. The implications of these features for diffusion and innovation are discussed and suggestions made for strategies of change.

Method

The paper is based on the knowledge and insight of the author, who is Project Director, Bureau of Applied Social Research, Columbia University.

Findings and Conclusions

1. Sieber identifies these four distinguishing features of educational structures: vulnerability to the social environment; the professional self-image and associated values of educational personnel; the diffuseness of educational goals; and the need for coordination and control of the primary clientele as well as of the employees of the system.

(a) *Vulnerability*—the degree to which an organization is subject to powerful influences from its environment irrespective of organizational goals and resources. The vulnerability of school systems has several implications for innovation:
  (1) Changes in practice that might disturb the local community are shunned.
  (2) The adoption of innovation often depends more upon political feasibility than educational value.
  (3) Innovations receiving wide publicity through the mass media become candidates for adoption, irrespective of their educational value.
  (4) Internal relationships of a vulnerable system may be affected so as to reduce serious experimentation.

(b) *Quasi-professionalism*—certain attributes of the teaching force, such as amount of training, distinguish this occupation from recognized professional groups and result in a discrepancy between the aspirations of teachers and occupational reality.
  (1) The insecure professional self-image of teachers increases resistance to change and mitigates against communication of innovation.
  (2) Status insecurity can also cause "ritualism," or excessive regard with means, to the neglect of ends or goals.

(c) *Goal diffuseness*—terminal goals of education and measurement of their attainment are difficult to specify, especially the long-range socialization goals.
  (1) This diffuseness reinforces the effects of status insecurity and vulnerability on innovation.
  (2) Difficulties in measuring the attainment of goals makes it hard to reach consensus regarding the efficacy of particular skills.

(d) *Formal coordination and control*—the bureaucratic structure of educational institutions causes strain for the professional roles and reinforces the effects of quasi-professionalism. Also, the emphasis on organizational efficiency tends to result in an avoidance of changes that require adjustment of the organizational structure, especially if they threaten the traditional methods of coordination and control.

2. *Strategies of Change*—three classical strategies for inducing educational change are identified:

(a) *The rational man strategy,* in which one-way communication is adequate since information is considered the major need of practitioners. This strategy fails to consider the four aspects of the educational system discussed above.

(b) *The cooperator strategy,* which involves the participation of members of the system. This strategy overemphasizes the personalistic aspects, resulting in a tendency to view resistance to change in schools as a function of individual characteristics rather than as a matter of status insecurity, peer group pressures, or bureaucratic hindrances.

(c) *The powerless participant strategy,* which assumes that practitioners are unable to make major changes in the educational structure, and energies are directed through legal and bureaucratic channels, "with directives flowing downward and evidence of compliance flowing upward." That practitioners are not powerless is often demonstrated through subversion of formal directives based on this strategy.

3. A *status-occupant* strategy of change is needed which takes into account the distinctive characteristics of educational structures and the conditions under which practitioners will respond to the tactics applied in each of the three traditional strategies. The image of practitioners as status occupants assumes that "they are imbedded in an intricate network of role relationships that holds its shape as a consequence of shared values, shared solutions to status problems, and shared sanctions for deviance and conformity" (p. 139).

4. *Implications for Strategy*—reorganization appears necessary at both the local and national levels.

(a) At the local level, school systems should be structured so as to allow teachers to act in accordance with their professional aspirations. For example, a teacher might be authorized by the school board to try out a new development in which he is interested. After obtaining board approval the teacher would be given special funds, released from routine teaching duties, and authorized to modify regulations, reallocate resources, reassign students, and dole out rewards and penalties for those within his jurisdiction for a specific period of time. The relationship of local administrators to these teachers would be restricted to that of facilitation and consultation.

(b) Beyond the local level, it may be necessary to organize agencies representing several national ancillary structures (Federal and State offices, publishing houses, accreditation agencies, universities, and the mass media) that would serve as coordinating bodies in order to avert the problems arising from local and regional vulnerability and would capitalize on national vulnerability to better advantage. By having each national coordinating body focus on one innovation at a time, resources and tactics would be mobilized for more effective and thorough efforts that could draw from a combination of all three classical strategies of educational change.

244

KNOWLEDGE DISSEMINATION
Research utilization: education
Change agent

EMPIRICAL STUDY

Sieber, S. D., Louis, K. S., and Metzger, L. The use of educational knowledge: Evaluation of the Pilot State Dissemination Program. In H. Hug (Ed.), *Evolution/revolution: Library-media-information futures.* New York: Bowker Co., 1974.

Purpose

The Pilot State Dissemination Program was undertaken in 1970 to try out an educational extension and retrieval system on a scale large enough to derive guidelines for future state-level projects. This article summarizes part of the program report.

Method

Two rural areas and one urban area were selected for the experimental program. Several field agents were employed in each state to meet with prospective clients, identify their needs or problems, refer these needs to a retrieval staff who performed computer or manual searches of information sources (e.g., ERIC), receive and scan the information, deliver it to the clients, and possibly help them to interpret and apply it. Technical assistance was made available to the three projects. In all, there were seven field agents, three project directors, and about 12 retrieval personnel.

Since the program was exploratory, the research focused on documentation of inputs, processes, and situational factors rather than on highly controlled evaluation.

Findings and Conclusions

1. *Goals.* The program had two main goals: (a) to test the interpersonal linkage role of extension agents and (b) to demonstrate the accessibility of a national data base for educational problem solving. The researchers studied how the goals of project directors changed over a year of operations. Experience led the directors to revise their unrealistically high levels of aspiration. One director, for instance, had hoped to influence local school system goals via the program but found that the program could not do this.

2. *Field agent roles.* There were three phases of field agent activity:

(a) *Input interaction.* The agent contacted the

community to publicize and create demand for his services. The authors describe several instances of initial interaction with a client system.

(b) *Referral and screening.* Turnaround time was an important criterion for getting information back to the client. Sometimes an agent would retrieve the information from his own resources; the authors are wary of this practice, since the agents could not provide comprehensive information. Agents with heavy case loads found it difficult to scan the information they were to deliver, but scanning was seen as a vital function in view of the next stage.

(c) *Output interaction.* In the output phase, the agent shifted from being a messenger to being an interpreter and change agent. Many problems were encountered with balancing the quality and the quantity of the service. The authors outline ways in which the service could be made more efficient (i.e., how to provide more service with no loss to the quality of the service). According to the authors, the agents succeeded in reaching into the lower levels of the educational system. Clients generally were satisfied with the agents' work. In fact, the field agents' assistance was valued more highly than that of specialists in two of the three areas. Their main contribution lay in encouraging and sustaining the interest of clients in utilization of knowledge.

3. *Information retrieval.* Initial problems with computer-based information were overcome. A major innovation was the development and use of packets of information on popular topics. This made searching easier, since it was necessary only for the unusual case. The authors discuss the trade-off between the efficient local response to a request for information and the comprehensive (high quality) regional response. Turnaround time was generally two weeks, but clients tended to underestimate this time and to become dissatisfied. Screening added to the turnaround time, but the "late" information was still used. According to the authors, the advantage of taking more time to retrieve and screen must be weighed against the disadvantage of alienating the less motivated clients. With regard to subject matter, educational personnel were found to be much less concerned with the foundations of learning than with ready-made innovations and how-to-do-it materials.

4. *Organizational issues.* Problems were encountered with project directors who worked only part time on this program. The authors recommend a full-time appointment for the director. The authors also recommend that field agents be located in intermediate (e.g., county) agencies because state and local agencies often have poor relations with each other. The pilot projects developed three types of linkages with the state organizations: a resource linkage, a control linkage, and a client/user linkage. Despite problems, the projects were well on their way to becoming recognized institutions within the state education agencies when the evaluation study was ended.

The authors conclude by noting three aspects of the success of the program: (a) the program developed a model for future extension and retrieval programs, (b) field agent generalists were shown to be superior to subject matter specialists, and (c) the majority of clients in all areas (76 percent to 90 percent in ten different areas) not only expressed the intention of using the service again but also had recommended it to others.

245

KNOWLEDGE DISSEMINATION
Dissemination measures
Utilization barriers

EMPIRICAL STUDY

Smith, R. L., Hawkenshire, F., Lippitt, R. O. *Work orientations of teenagers.* Ann Arbor, Mich.: Institute for Social Research, University of Michigan, 1969. (Report for Contract No. OE 5-85-067 for project No. 5-0118.)

Purpose

The study was undertaken to test a variety of dissemination activities in order to help sharpen an appreciation of the critical issues involved in the utilization process—particularly as they relate to the findings of social research.

Method

The study was carried out in school settings and was focused on two questions: what do youth think, feel and do about work and play and why? How can we change what the marginal student thinks, feels, and does about learning? To provide data for the first question, approximately 1,200 teenagers were interviewed in eight Detroit area public schools and three Michigan juvenile institutions. These findings were disseminated and answers to the second question sought through three dissemination projects: (1) an hour-long faculty meeting (at a high school) at which the findings were presented; opportunity was provided for participant reflection and feedback, postmeeting reactions were summarized and circulated to participants, and a 6-week follow-up questionnaire was distributed; (2) a 4-hour retreat-type workshop which enabled participants to be at their school fulfilling their regular obligations at beginning and end of day, with essentially the same format followed as in (1), above, except that there was more ample opportunity for small-group participation; there was more emphasis on the participants actually designing a program to meet some of the issues raised; and the researchers, to a limited extent, provided consultative aid in the follow-up period; (3) an 8-hour session (divided into two parts) with the preceding format elaborated to permit more intensive and systematic program development, critical review by other participants, and interchange with a group of young persons typical of those who would ultimately be recipients of such programs. Relative efficacy of the three activities are analyzed and compared.

Findings and Conclusions

1. The major barriers to knowledge utilization are identified as:

(a) Psychological resistance (fear of the new, reflection on one's competence, etc.).
(b) Sociological resistance (challenge to status within system).
(c) Ecological resistance (shortage of manpower, space, other resources).
(d) Economic resistance (costs of retooling for innovation).
(e) Political resistance (changes of balance of power within system).

2. The evaluation of the dissemination activities carried out in this study is presented in terms of the following dimensions:

(a) *Content:*
  (1) The appropriate unit for dissemination should be the fully developed program rather than the basic findings and their implication.
  (2) All aspects of the program should be thoroughly covered.
  (3) Implementation issues raised by the nature of the program should be dealt with exhaustively.
  (4) Findings from research should not be presented per se but be selected and interpreted within the context of clarification and illustration.
(b) *Participants:*
  (1) Dissemination materials should be designed to be directly aimed at those specific persons in the system who will be most involved in the program and who will be called upon to develop new skills and perspectives.
  (2) Different materials should be prepared for those with different roles and responsibilities.

(c) *Format:*

(1) Of the three settings tested in this study, the optimum was the 4-hour workshop, which removed people from their usual routine but did not require demanding travel and inconvenient absence from work.

(2) There should be built-in checks to validate the pacing of the information and the set of the participants.

(3) Process checking should be discreet and should not dislocate content dissemination and discussion.

(d) *Implementation of objectives*—the implementation will have the best chances of success if those undergoing skill training are made aware of the links between what they are being required to master and what they already know.

246

RESISTANCE TO CHANGE: TECHNOLOGICAL

Change process: cross cultural
Change factors

CASE STUDY

Spicer, Edward H. (Ed.) *Human problems in technological change: A casebook.* New York: Russell Sage Foundation, 1952.

Purpose

To demonstrate, through the use of case examples, the factors related to the success and failure of cross-cultural change efforts. The book also presents guidelines for the study and analysis of the effects of technological innovation.

Method

Each of the cases presented in this collection offers an example of an effort to bring about change in a culture. Both successful and unsuccessful attempts are included. An analysis of each case is provided.

Findings and Conclusions

The following ideas are the most relevant to research utilization:

1. Resistance is not necessarily a condition of change. Resistance to changes may be a symptom of something wrong in the particular situation. It could indicate a real impracticality of the proposed change or suggest unsatisfactory relations between the change agent and the organization.

2. Once resistance is seen as a symptom of special conditions rather than as a constant element, it becomes possible to discover causes of success and failure of change efforts through the study of cases in which resistance appears. The following generalizations are supported by case study:

(a) People resist change that threatens basic security.

(b) They resist proposed changes that they do not understand.

(c) They resist being forced to change.

3. A list of questions constituting a master checklist which might be used for gathering information on proposed change in a wide variety of situations is given. Answering these questions should facilitate change efforts:*

(a) What, if anything, will the introduced procedure or method replace?

(b) What other elements in the system are likely to be modified as a result of the introduction?

(c) What other elements will have to be modified if the new procedure is accepted?

(d) What other new procedures, etc., are likely to be demanded as a result of the situation?

(e) Who in the institution will have to abandon or change his occupation if there is a change introduction?

(f) Who in the institution will immediately

*Some questions have been paraphrased to make them more relevant to mental health.

benefit from the introduction? Will the benefits be in economic advantage, prestige or what?

(g) Who is likely to suffer immediately, in what way?

(h) Will shifts in occupation affect the division of labor between professional groups?

(i) What are the formal and informal social organizations of those affected?

(j) How are these social organizations likely to be affected? Will their power or social position be enhanced or lowered?

(k) Is there a possibility of the introduction opening up new forms of cooperation? Of conflict?

(l) Do the individuals and group leaders affected understand the nature of the introduction?

(m) Who has participated in the planning of the change? Who has not participated?

(n) What elements of the system other than the particular introduction are likely to be affected? For example, will personnel changes be required, differences in training programs?

(o) Does the proposed change reinforce other components of the system or conflict with them?

(p) What are the attitudes toward the innovator as a person? Toward the professional group or other groups of which he is a member? To his affiliations in general?

(q) What is the recent history of the relations between the change agent or the group introducing the new procedure and the practitioners in the institution?

(r) What is the history of similar previous introductions to this group?

4. Several recurrent groups of problems are identified for use in diagnosing or analyzing situations and as a basis for developing principles for solving human problems:

(a) *Problems of cultural linkage* emerge because of failure to understand the connection between certain beliefs and customs.

(b) *Problems of social structure* arise from failure to work through existing social organizations or from miscalculation as to what the functioning social units are.

(c) *Problems of the role of the innovator* may develop from poor relations between the people of the different cultures involved, or from misunderstanding or poor definition of the role of the innovator.

(d) *Problems of cultural bias* may arise from interpreting behavior in one culture in terms of another culture.

(e) *Problems of participation* are due to failure to bring people into the planning and carrying out of a program of change.

(f) *Problems of buffer organization* may develop from any of the above problems and result in the organized resistance to change by the members of the system involved.

247

RESEARCH DISSEMINATION
Dissemination measures
Conference evaluation

CASE STUDY

Spooner, S. E. and Thrush, R. S. *Interagency cooperation and institutional change.* Final Report on a special manpower project prepared under a contract with the Manpower Administration, U.S. Department of Labor. Madison, Wisconsin: University of Wisconsin, 1970.

Purpose

The purpose of the demonstration was to test techniques for the effective dissemination of meaningful findings of a research project. The focus was less on having the research results explicitly utilized than on having the dissemination efforts stimulate institutional change.

Method

The research project selected as the base for the

demonstration was a DOL-funded Mental Health and Manpower Project at Fort Logan Hospital in Denver, Colorado, through which supportive techniques were employed to assist released mental patients in getting and retaining employment. To disseminate the results of this project, a three-day conference was held in Madison in October 1969; participants were selected from the six states of Region V, and included representatives of 17 mental hospital centers in these states and from Employment Service and Vocational Rehabilitation Service. Project staff from Fort Logan served as resource personnel. Conferees were encouraged to formulate specific implementation plans for adoption or adaptation of the Fort Logan findings. Subsequently, the University of Wisconsin functioned as follow-up agent for several months; in personal contacts and by telephone they offered assistance and encouragement to the state teams in carrying through their implementation plans. Results were informally evaluated.

Findings and Conclusions

1. The implementation plans developed at the conference included:

(a) Cooperative interagency activities
  (1) Sharing staff
  (2) Interagency meetings
(b) Staff educational efforts
  (1) Training staff
  (2) Information transfer
(c) Patient educational efforts
(d) Posthospital activities
  (1) Sheltered workshops and lodges
  (2) Placement and follow-up
  (3) Use of community resources
(e) Miscellaneous
  (1) State support
  (2) Patient definition
  (3) Proposals for funding

2. No specific findings are reported with respect to results in terms of increasing the number of mental patients who were gainfully employed, but the overall impression of the Madison staff was that the demonstration was successful in terms of sending people home from the conference "eager, charged with energy, and filled with crusading spirit." It was felt that institutional change was initiated in many instances.

3. Although not all of the state teams were successful in implementing all of their plans, most of them reported some progress in each of the above-listed categories. (This is reported in descriptive terms only.)

4. The postconference follow-up is believed to have been extremely useful in strengthening implementation. The report states: ". . . the most effective thing we were doing was providing a contact person to whom teams could talk, tell their troubles, and brag about their successes—and from whom they could receive support, encouragement, and occasional help in opening communication lines to others." (p. 12)

5. Recommendations advanced by the staff include:

(a) Freedom for local adaptation of research results.
(b) Consistent and visible support from above for local personnel.
(c) Assignment of research utilization training to persons with high peer group acceptance.
(d) Recognition that dissemination alone will not accomplish research utilization, but that institutional change requires programs psychologically planned to foster behavioral change.

248

KNOWLEDGE DISSEMINATION: SCIENCE

Communication process
Information needs

ANALYSIS AND SUGGESTIONS

Swanson, Don R. On improving communications among scientists. *Bulletin of the Atomic Scientists,* 1966, 22, 8-12.

Purpose

To propose suggestions for improving informal information practices in the dissemination of scientific knowledge.

Method

The author bases his conclusions on his experience in library work and a review of related articles and studies.

Findings and Conclusions

1. Possibly 85 percent of useful scientific information is exchanged informally and verbally before the usual bibliographic tools are consulted to ascertain whether or not published information is available.

2. Informal communication takes place for the most part within relatively small groups of individuals.

3. As scientific knowledge accumulates, it necessarily divides and subdivides into increasingly narrow specialties. The summary and packing down of scientific knowledge makes progress possible without floundering in the backlog of published information.

4. Mechanization itself cannot be considered an answer to the problem of the information explosion.

5. The future information system should seek out its customers. Its activity must be directed, purposeful, and marked by continuous feedback of the consequences of its actions.

6. Informal information practices should be aided and amplified by: (a) identifying the information-exchanging groups; (b) improving and expanding the selective communication systems within these groups; and (c) employing a high level of feedback to check on the value of the information disseminated.

7. These processes of dissemination and feedback can be instrumental in the task of identifying "invisible," overlapping groups and other potentially interested groups as distribution targets.

249

CHANGE PROCESS: SOCIAL

Researcher-practitioner collaboration

ANALYSIS

Taylor, James B. Introducing social innovation. Paper presented at meeting of American Psychological Association, San Francisco, Calif., September 1968.

Purpose

The author undertakes to identify troublesome issues typical of interdisciplinary research.

Method

In a brief and informal presentation, the author draws upon his own experience and observation to formulate principles relevant to his purpose. He draws heavily on the experience of a project in Topeka which proposed to develop more effective psychological rehabilitation procedures for low-income people (5-year VRA grant). The project was interdisciplinary, required extensive community

involvement, and was sufficiently successful so that when funding terminated, services were continued under local funding.

Findings and Conclusions

1. Interdisciplinary research is hampered by problems of interdisciplinary cooperation. Most professional disciplines are indoctrinated during training with professional *identity*; this insular emphasis makes the professional person ill-adapted to cooperative research.

2. Research objectives are prematurely formalized. Clearly defined conceptualization, though appropriate for basic research, may be limiting for applied research. Before research design is formulated, the question of usefulness should be explored: one asks not only whether the approach will work, but whether it will produce unexpected side effects. Applied research must be developed in terms of cost and consequence, balance and loss, rather than in terms of neat experimental design.

3. Social innovation may disrupt complex and valued roles, identities, and skills; accordingly, such innovation may die from malnutrition, be forcibly rejected, or may be so changed that it loses its essential character. In the author's opinion, many of these problems were circumvented in the Topeka project he cites. From his observation of this project, he draws the following principles for successful introduction of social innovation.

(a) *The principle of maximum involvement*—the multidisciplinary staff was profoundly committed to the project.

(b) *The principle of cooptation*—there was interpenetration of personnel from other groups and agencies. Hence, when the project drew to a close, a variety of agencies were familiar with its potential utility and willing to support its continuance. They perceived it as helping rather than threatening.

(c) *The principle of egalitarian responsibility*—each member of the research team had an equal hand in formulating and, later, in reformulating the research issues. They were creative professionals engaged in a learning task. Research was preceded by a six-month period of field exploration in which clinicians became acquainted with the low-income neighborhood and its inhabitants. The issues of status were dissolved as the research team struggled with the collective task.

(d) *The principle of research as creative play*—at the outset, social workers and psychiatrists were awed at the prospect of research. Psychologists perceived of research as a "malignant superego" (rigid, precise, foreboding, superhuman, fault-finding, arrogant, carping). Because the project was approached with freedom and flexibility, these stereotypes did not persist.

(e) *The role of the research leader as spokesman and ideologist*—there was an unusual amount of freedom, but it was freedom within limits. The research leader provided structure and discipline, acting as coordinator, ideologist, and taskmaster.

250

KNOWLEDGE UTILIZATION
Utilization factors
Knowledge selection

CONFERENCE REPORT

Thomas, Edwin J. Selecting knowledge from behavioral science. In *Building social work knowledge: A report of a conference.* New York: National Association of Social Workers, 1964, pp. 38-48.

Purpose

Knowledge essential to practice is a growing, ever-changing body of provisional concepts, hypotheses, and theories. In this article the author provides a list of criteria for selecting potentially useful research topics and findings. The article is aimed at both the researcher and the practitioner.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. *Selection Criteria:*

(a) *Content relevance*—the framework for organizing social work knowledge should include a breakdown according to subject matter areas and levels (individual, group, organization, community, society) for which the findings are relevant.

(b) *Knowledge power*—this criterion refers to the validity, reliability, and potency of research findings.

(1) The validity of propositions is determined by the extent of corroboration among propositions.

(2) Prediction potency is related to the strength of a given proposition or variable in predicting outcomes and/or differences.

(3) Variable potency is determined by the amount of variance explained. The more variance explained, the more potent the variable.

(c) *Referent features*—the referents used in research need to be:

(1) *Identifiable*—the action one may take with respect to a variable is obviously greatly determined by the extent to which indicators of that variable are identifiable. If a referent is not identifiable it cannot be accessible.

(2) *Accessible*—the extent to which any given referent may be approached in action by a professional helper should also be considered by the researcher. The importance of accessibility is that its presence is necessary if the research is to have practical application.

(3) *Manipulable*—direct action is only possible with variables that can be manipulated by the practitioner; this includes cost factors. That is, is it economically feasible to manipulate the variable in practice.

(4) *Potent*—the researcher needs to consider those referents that exert the most influence in any existing helping context. An indicator may be weak in a helping context even when the variable has high potency in the research context.

(5) *Ethically suitable*—the variables for proposed manipulation must be ethically suitable for such action. For example, research based on the offering of bribes or sexual inducements would be ethically unsuitable, while research focusing on the positive reinforcement aspects of repeating a client's statements would be ethically acceptable.

2. *The Applicability of Knowledge Resulting from the Screening Criteria*—the author asserts that distinct types of applicability may be identified on the basis of criteria fulfillment.

(a) *Material immediately applicable for direct action* is that which meets all screening criteria. The author cites reinforcement theory as an example.

(b) *Material immediately applicable for complementary action* is that which meets the criteria of content relevance, knowledge power, referent identifiability, and potency but fails other referent standards. That is, the referents are: inaccessible, too costly, nonmanipulable, ethically unsuitable. Research in personality and persuasibility is cited as an example of this type of research.

(c) *Material hypothetically applicable for direct action* is that demarked by knowledge that fails noncritically on one or more of the screening criteria.

(d) *Material hypothetically applicable for indirect or complementary action* is that research that has not clearly indicated its presumed relationship to therapeutic outcomes.

(e) *Inappropriate material* is that which critically fails to meet the screening criteria.

3. The author concludes with the following statement: "Utilization of research findings is not a direct simple importation; rather it calls for detailed, thoughtful appraisal of relevance of the content, power of the knowledge, as well as many practical considerations relating to the knowledge referents."

251

INNOVATION: BUREAUCRACY
Organizational factors
Innovation characteristics
Barriers to change

ANALYSIS

Thompson, Victor A. Bureaucracy and innovation. *Administrative Science Quarterly,* June 1965, 1-20.

Purpose

The paper considers the obstacles to innovation within the modern bureaucratic organization and makes some suggestions for changes that would facilitate innovation.

Method

This is a theoretical study derived from the author's observations and analysis.

Findings and Conclusions

1. Characteristics frequently found in bureaucratic organizations which serve as barriers to innovation include:

(a) The organization often is monocratic; there is only one point or source of legitimacy.
(b) Conflict is not legitimized and this depresses creativity.
(c) Control over all resources is centralized.
(d) It offers extrinsic rewards of money, power, and status, rather than satisfaction from one's work.
(e) This reward structure places a high value on compliance and conformity.
(f) In a monocratic organization, there is veto but no appeal; such an organization may allow new ideas to be generated, but is apt to veto them.
(g) The characteristic psychological state in a bureaucratic organization is one of anxiety and chronic dissatisfaction; this leads to a conservative orientation in which innovation is perceived as threatening.
(h) The bureaucratic organization is highly departmentalized, with such innovative activity as it permits segregated into research and development units.
(i) Bureaucratic organizations are staffed primarily by the "desk classes" and only minimally by professionals.
(j) In such organizations, praise and blame attach to jurisdictions; one feels that he can only fail once.

2. The attributes of the innovative organization are presented in terms of their:

(a) General requirements:
  (1) There must be uncommitted resources—money, time, skills, and goodwill.
  (2) A diversity of inputs will be allowed, since this is needed for the creative generation of ideas.
  (3) There must be neither a complete commitment to nor a complete alienation from the organization; rather, the individual perceives the organization as an avenue for professional growth.
  (4) Rewards in such an organization come primarily from the search process, professional growth, and the esteem of colleagues.
  (5) The creative atmosphere must be free from external pressure; one waits for the best solution, rather than being forced to accept the first solution.
  (6) The innovative organization is primarily a professional one.
  (7) In such an organization, power is dispersed rather than concentrated.

(b) Structural requirements:
  (1) The innovative organization will be relatively loose structurally; job responsibilities will not be narrowly defined.
  (2) The organization will not be highly stratified; there will not be "awesome" status differences, and communications will flow freely.
  (3) Group processes will be used more (and more openly) than at present. The professionals in the organization will enjoy multiple-group membership which will serve as a counterforce to the authority grouping. That is, when a new idea is

supported by a group, it is not so readily vetoed.

(4) The innovative organization is not highly departmentalized, hence, not highly parochial.

(5) The simplest unit in the organization should not have a highly specified task, but should be an integrative unit of professionals and support personnel. The organization of such units should be project oriented.

(6) Ideally, such an organization should be capable of restructuring itself continually in the light of changing tasks of problem solving; leadership will be rotating rather than constant.

(7) There will be "devaluation of authority and positional status and the recognized, official sharing of power and influence" (p. 18).

3. The following implications for administrative practice are cited:

(a) Annual performance ratings by superiors probably will have to be dropped.

(b) There will be an increasing proportion of professionals, and job descriptions and classifications will be modified accordingly.

(c) Peer evaluation will be increasingly important in recruitment and placement.

(d) Procedures with respect to secrecy and loyalty (for example, patents, publications) will be modified.

(e) There will be greater intraorganizational mobility.

(f) Resources will be fluid rather than overspecified.

(g) Administrative activities will be dispersed and decentralized.

252

ORGANIZATIONAL CHANGE
Innovation: industrial
Organizational climate

CASE STUDY-ANALYSIS

Thorsrud, E. Socio-technical approach to job design and organizational development. *Management International Review*, 1968, 8, 4-5.

Purpose

To outline the general approach to organization change taken by the "socio-technical" school and to review the experiences and findings of the Work Research Institutes concerning a series of field experiments in Norway.

Method

Literature review, theoretical discussion and presentation of three field experiments.

Findings and Conclusions

1. *The research problem and its social implications.* The welfare state and union-management cooperation are very highly developed in Scandinavia. On the industrial scene scientific management has been simplifying jobs, but the workers require more complicated work because they are well educated. Two main approaches have been attempted: greater worker representation in decision making and human relations-oriented personnel policies.

The author and his colleagues from the Work Research Institutes studied foreign approaches to worker-management collaboration and five cases where the workers were represented on the boards of directors of Norwegian firms. Neither seemed to offer valid solutions. Representatives of workers on the boards either represented workers' interests against the rest of the board or (more often) differed little in their approach from other members, under the assumption that the more profit the firm made, the more would go to the workers. Where an attempt had been made to share power, the researchers found that the workers did not actively participate in the representative systems.

Thorsrud and his colleagues determined, how-

ever, that the workers have both the interest and the ability to take over more responsibility for their immediate work situation (as opposed to the higher level activities which were involved in the previous attempts at industrial democracy). Thorsrud notes: ". . . the key to the problem lay in democratizing the relations on the job itself, rather than in superimposing elections, representatives, joint committees, and the like."

2. *The socio-technical system.* The researchers decided that autonomous work groups might be the kind of innovation that would jointly optimize management and worker interests. But there were no ready-made solutions to the particular problems in Norway. The researchers decided to: (a) establish experimental sites that would discover, test, and demonstrate ways of applying socio-technical principles and (b) establish influence networks that would press for diffusion of new practices which proved to be effective.

3. *Socio-technical field experiments.* A steering committee for socio-technical research in Norway, consisting of representatives of the national unions, the national employer's confederation, the government, and the researchers, picked three sites for testing new approaches. In negotiating, the researchers protected both the workers and the managements involved by trying to minimize the extent to which either would be committed to long-term acceptance of the change.

The first experiment took place in the wire drawing mill of the iron/steel works at Christiania Spigerverk in Oslo. Before the changes, each man would tend a series of machines in the wire drawing operation. Usually, he had little to do, but when the wire broke, he would have to fix the process alone—though it was basically a two-man job. The mill was redesigned, with very little technical change, so that a group of men took group responsibility for a group of machines. This experiment produced difficulties of an unexpected kind: productivity rose so much that the pay and time standards of the whole plant—and perhaps for all unionized workers in Norway—needed to be revised.

The second experiment dealt with the chemical department in a pulp/paper mill. The main task was information handling, and since the information-handling technology would have to be changed, it was not possible to stop the experiment and go back to the old way. In this instance a local, joint action committee took charge of the changes. Improvements were gradually established in the information system, multi-skilling of operators, supervisory training, and in relations between staff and line organization.

The third experiment involved reorganization of the manufacture of electrical panels for heating at the NOB factory near Trondheim, Norway. This process had been designed by industrial engineers so that the jobs were simple and repetitive, and the workers were paid by piece rate individually. The researchers created three groups where operators worked on several aspects of production, without any direct supervision by foremen, and where wages followed group incentive plans.

(a) The group system was preferred by management as well as operators when the department was reopened after a two-month stop following the experiment.
(b) The group took over responsibility for planning and coordination.
(c) Flexibility to cope with production variations increased, mainly through multiskilling for more than one job and through job rotation.
(d) Total production and earnings went up to approximately 20 percent above the pre-experimental rate.

253

RESEARCH UTILIZATION
Communication process
Innovation: welfare agencies
Utilization measures

ANALYTICAL MODEL

Unco, Inc. *Communication model for the utilization of technical research (CMUTR) study: Utilization of advanced management innovations within state departments of public welfare.* Washington, D.C.: Unco, Inc., 1973.

Purpose

The study was designed to determine how communication factors affect research utilization and to develop a model to facilitate the application of innovative management techniques to social services and welfare reform. It attempted to identify major communication variables affecting the decision-making process regarding the acceptance of the techniques. As a practical outcome, guidelines for such utilization were prepared for use by federal, state, and local social welfare agencies. These guidelines, together with the paradigm or communication model that emerged from the study are directed toward closing the communication gap between technical personnel responsible for demonstration projects and practitioners, managers, or consumers.

Method

Four advanced management innovations in the social welfare field were studied, not so much in themselves, but to determine the communication and utilization processes that accompanied their introduction and execution:

1. A social services reporting system in Colorado.
2. A case administration service system in Minnesota.
3. A standard form recording system in Washington.
4. A relative cost effectiveness model in all three states.

Fortified with a review of the literature on research utilization and with the advice of a task force, the staff of the CMUTR study planned and conducted a total of 54 field interviews with state and local staff members in the mentioned states. A preliminary conceptual model helped to determine the types of data to be gathered, while the interviews were used in revamping the model. Items relative to the communication process and the research utilization process were stressed.

Findings and Conclusions

1. The specific findings derived from the interviews were arranged under the following categories:

(a) *The structure existing between the promoter and the user,* including such matters as:
  (1) The number of intermediaries between user and promoter.
  (2) Type or functional role of intermediary.
  (3) Communication paths or links.

(b) *Communication efficiency*, including such items as:
  (1) Method.
  (2) Direction.
  (3) Relation of sender to receiver.
  (4) Language.
  (5) Receiver background.
  (6) Content.
  (7) Volume of messages by communication paths or methods.

(c) *Need in terms of users and promoters*, including such considerations as:
  (1) Solution concept, innovation specific.
  (2) Packaging of specific innovation demonstration projects.
  (3) Circumstances external to the project.

2. These findings are interpreted as fitting into a *communication model* described in great detail, which when combined with ideas from other models reported in the literature, leads into a *basic innovation utilization cycle* that entails the following four phases:

(a) Need awareness and problem identification.
(b) The formal selection of innovation.
(c) The demonstration of the innovation.
(d) Innovation implementation and utilization.

Important implication of the innovation cycle for

communication relate to a consideration of the solution/need match, the external versus internal promotion of the innovation, and the compatibility of the innovation with the existing mode of operation.

3. Ideas from the communication model and from the innovation utilization cycle are fused in a *communication paradigm for innovation utilization*, which entails:

(a) A decision network.
(b) An account of success probabilities and completion times.
(c) The basic communication paradigm.
(d) Factors determining the utility of the innovation.
(e) The decision-making process.
(f) Feedback communication.
(g) The role of translators.
(h) Factors affecting communication efficiency.
(i) The interaction of segments of the process.

The model is seen as serving predictive and controlling functions, but to a degree only. Hopefully, the application of the model will increase utilization probability and decrease completion time. In sum, the authors conclude that the decision network approach appears to be a useful device for planning the utilization process, monitoring its progress, and, as noted, maximizing utilization probability and minimizing completion time.

4. The study resulted in a separate report entitled *Guidelines for Research Utilization* (Unco, Inc., 1973b), which presents 25 "operating principles." Each principle is accompanied by a brief rationale and by a statement of proposed items that should be checked to assure the likelihood of the realization of the principle. The principles are arranged according to elements of the utilization and communication processes, as follows:

(a) Utilization cycle:
  (1) *Need awareness and problem articulation:*
    • The user must first experience the need for change.
    • The problem should be articulated precisely.
  (2) *Choosing a solution:*
    • The chosen solution should fall within the operational constraints of the user's organization.
    • Utilization is a function of economic, political, and social costs.
    • For utilization, the innovation requires technical validity.
    • The need and the solution should match.
  (3) *Demonstration:*
    • In addition to theoretical validity, the solution needs to be demonstrably valid under realistic user conditions.
    • Relevance to the user's methods of operating needs to be demonstrated.
    • The feasibility of implementation in an ongoing situation needs to be demonstrated.
    • Performance objectives and criteria should be cooperatively established prior to beginning a demonstration.
    • Demonstrations should be designed with flexibility and modularity.
  (4) *Implementation:*
    • Several "hurdles", or start-up costs, may be expected between demonstration and implementation.
    • During utilization, there will be periodic need for modification.
  (5) *User involvement:*
    • Users should participate in the planning of the implementation.
    • Users should be aware of their response to the utilization of the solution.
  (6) *Contingency planning:*
    • If demonstration time is long, intervening policy changes may render the solution irrelevant or unnecessary.
    • There should be a resource pool to be drawn upon when unanticipated research utilization problems occur.
(b) *Communications:*
  (1) *Message characteristics:*
    • Message content needs to be within the receiver's competency domain.
    • Excessive communication may be counterproductive to utilization.
    • Messages should be in language that is familiar to the receiver.
    • Written communication rarely elicits local support for an innovation or solution, though useful in conveying technical or factual matter to large audiences.
  (2) *Communication structure:*
    • A well-specified communication structure is critical for effective communication, and hence utilization.
    • Communication structures typically lack critical links, such as those between technical and operational groups.
    • The absence of feedback will deterio-

rate the quality of messages and generate misunderstanding and resistance to innovation.

- The effectiveness of message conveyance requires the realization of the role of translation.

254

RESEARCH UTILIZATION: AGING

Utilization measures
Utilization barriers

ANALYSIS AND SUGGESTIONS

U.S. Department of Health, Education, and Welfare. *Research utilization in aging: An exploration.* Washington, D.C.: The Department, 1963.

Purpose

The purpose of this brief volume is to focus attention on problems of research utilization as related to aging.

Method

The most relevant sections consist of personal beliefs based on the experience of the contributors.

Findings and Conclusions

1. *In order to maximize the chances of getting research utilized, one should:*

(a) Understand the frames of reference within which individuals perform their professional tasks.
(b) Work through practitioners.
(c) Consider the motivations of the audience and their perceptions of the change agent's motivation.
(d) Show people how new procedures can help them rather than criticize them for what they have been doing wrong.
(e) Realize that people owe greatest allegiance to activities in which they are committed by direct participation. Attitude change will follow behavior change.
(f) See that messages are repeated over and over. There are wide variations in response to communication. Some people will accept right away and later reject; others will ignore; others will reject and then accept.

2. *Barriers to utilization of research are:*

(a) The practitioner's need for how-to-do-it guidance; not possessing the skill to put findings into operational terms.
(b) The damming-up of information was seen as another barrier. Information of potential interest often strikes barriers of rigid departmentalization.
(c) The reluctance of administrators to accept research findings until they have personally tested their validity.
(d) Most social scientists hold the questionable view that the practical implications of research are not within their province.

3. *Suggestions for getting research to work were as follows:*

(a) Adapt fundamental techniques similar to the agricultural extension method.
(b) Hire staff personnel who are interested in research and know their research literature.
(c) Have more and better informed visits to researchers and demonstration projects. A barrier to implementing the above is that research staffs often feel visitors interrupt their work.
(d) To overcome this feeling of research staffs, one proposal was to add a demonstration visit supplement to basic research grants.
(e) Build utilization right into research projects by providing funds for adequate publication and dissemination of results.

255

RESEARCH UTILIZATION
Utilization strategies
Researcher-practitioner relationships
Research communication

ANALYSIS AND SUGGESTIONS

Van den Ban, Anne W. Utilization and publication of findings. In C. H. Backstrom and G. D. Hursh (Eds.), *Survey research methods in developing nations.* Chicago: Northwestern University Press, 1963.

Purpose

The author's purpose is twofold. First, she focuses on how the researcher can stimulate the utilization of his findings by practitioners. Secondly, she offers some advice on the publication of findings.

Method

This analysis is based on the author's experience and knowledge.

Findings and Conclusions

1. Practitioners will only use research findings to solve problems in a new way if:

(a) they realize they have a problem;
(b) they define their problem in such a way that it can be solved;
(c) they believe that research findings will help them to solve this problem;
(d) they have confidence in the capability and the motives of the researcher;
(e) they know the findings;
(f) they are willing to experiment with new solutions to this problem;
(g) they are in a social position to do so; and
(h) they believe that they can avail themselves of the money and other resources necessary to do so.

2. Research becomes relevant for practitioners when they participate in the research process. Utilization and application of findings require serious attention during the planning of the research project. "If a researcher starts to worry about it when writing his research report it is usually too late."

3. Several general characteristics of the practitioner-researcher interface are described:

(a) *Practitioner expectations*—sometimes practitioners expect a recipe for problem solution from the researchers. Since the practitioner and not the researcher is often held responsible for the failings of a given innovation, the practitioner is often unwilling to undertake experimentation with a new idea without the specific recommendation of the researcher. It is often impossible for the researcher to make recommendations of this nature.
(b) *Practitioner ruts*—practitioners are likely to do things as they have always done them without taking the time to think through whether this is really the best way. If the practitioner found a good way of doing things 20 years ago, he is likely to operate in this same vein even though considerable changes and advancements have been made. One reason for the continuance of old practices is the lack of time many practitioners have for ferreting out relevant research.
(c) *Researcher predictions of probable consequences*—the researcher should assume the responsibility for giving as much information as possible about the probable consequences of various alternative solutions to a problem, thereby making it easier for the practitioner to make the best choice.
(d) *Researcher as persuader*—often the practitioner must be *convinced* that he needs this kind of information or data for sound decisionmaking. Usually very little effort is made by the researcher to persuade; most of his efforts are directed toward informing.
(e) *More work*—frequently implementation of research findings involves more work for the practitioners. Often the additional effort is not compensated by other rewards.

4. Cooperation between researchers and practitioners is desirable in nearly every phase of the research process.

(a) *Formulating of research problems*—practitioner participation in the formulation of research problems usually results in research

problems which are more relevant for policy decisions. Practitioners know the problems they face daily in their work. They are also aware of the limitations imposed by the structure of the organization and situation. Knowledge of such variables is important for determining workable alternatives to problems. Such participation also decreases the psychological distance between the practitioners and research.

(b) *Deciding on research methods*—the author suggests that while the good researcher has the technical knowledge to decide which research methods may prove best to solve the research problem, it is desirable to ask advice from the practitioners even at this stage. Practitioners can contribute knowledge of the field situation, and knowledge of client or respondent problems and levels of understanding. Moreover, confidence in the research is built up if the practitioners see the care with which the research instruments are developed.

(c) *Gathering data*—the author advocates the participation of practitioners in data gathering as part of in-service training. The practitioner can also be a helpful feedback mechanism for the researcher by relaying information on the reactions aroused by the research project.

(d) *Analyzing and interpreting the data*—although the main responsibility for analyzing and interpreting the data remains with the researcher, it can be useful to involve practitioners as far as possible in this phase of the research process. The author cites several studies on the participation principle to support this contention.

(e) *Drawing conclusions for action programs from the research findings*—the responsibility for the action programs remains with the practitioners and not with the researcher. It is desirable for the researcher to elaborate on the implications of his findings, so the practitioner has some guidelines for utilization.

5. Tension may arise between researchers and practitioners in a close working situation. "In order to be able to work with enthusiasm a good practitioner should be convinced that his work is important and that the way he does it is basically correct. A good scientist on the other hand has the task to question this, which might make the practitioner uncomfortable and defensive" (p. 19). Tensions can be reduced if the researcher is sensitive, does not stress educational or status differences and recognizes he is only a specialist in research and that practitioners may often know more about the field than he does. Researchers can also stress the strengths of current practices or programs, and discuss in advance the expected role of the practitioners in research utilization.

6. Utilization of research findings cannot be expected unless the following conditions are met:

(a) the researcher has a real interest in the problems of the practitioner;

(b) the researcher cares about the utilization of his findings;

(c) the researcher is willing to invest time to develop better practitioners, who can take more initiative in decision making;

(d) the researcher is sensitive to and able to cope with the anxiety he might arouse with his research; and

(e) the superiors of research sponsors stimulate and allot time and money for working with practitioners.

7. Research findings will not be utilized unless supported by personal communication with practitioners. The author advocates the use of a middleman to serve this communication function. The researcher should see that a change agent or social science consultant is aware and convinced of the relevance of his findings, and then leave the job of communicating with the practitioners to the middleman.

The consultant can offer the practitioner the benefits of many different research findings as he will not have the psychological investment in one set of research findings that the researcher may have.

8. A research study is not finished before a report has been prepared and communicated to the audience one intends to reach. The author outlines the differences among reports designed for other scientists and researchers, practitioners and the general public. He stresses the importance of getting the findings to practitioners as quickly as possible, in as concrete as possible terms. He suggests the researcher prepare a report for practitioners and mimeograph some additional information on research methodology, which is sent to other scientists upon their request, or present this information in an appendix.

The author devotes considerable space to a specific discussion of writing style, presentation of figures, and other visual aids.

9. Another way of facilitating research utilization

is through seminar and/or in-service training. This adds the personal touch to the communication process that is important in persuading individuals to try new ideas.

256

CHANGE STRATEGIES
Change process: social
Intergroup conflict

ANALYSIS

Walton, Richard. Two strategies of social change and their dilemmas. In W. G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change* (2nd ed.). New York: Holt, Rinehart & Winston, 1969, pp. 167-176.

Purpose

The article depicts two contrasting systems of ideas about achieving one's ends in a conflict between two parties or factions, such as the United States versus the Soviet Union, or labor versus management. The report also aims to point up the dilemmas that must be faced when there are opposing points of view as to the more effective strategy.

Method

The author employs a speculative approach based on the consideration of instances of various types of conflict.

Findings and Conclusions

1. Some of our most pressing problems of social change are based on three assumptions: (a) a desire on the part of one group to change the allocation of scarce resources between two groups; (b) a desire on the part of leaders, despite recognition of areas of conflict, to establish a more cooperative set of attitudes between the groups; and (c) the absence of either law or compulsory arbitration mechanism which can accomplish the desired change or settle the conflict of interest.

2. Social scientists who have studied the question of conflict resolution have expounded two basic strategies—that of power wielding and that of attitude change, with problem solving as still a third possibility.

3. Tactics associated with the power strategy approach include the following:

(a) In order to establish a basis for negotiations with the other and improve the probable outcome for itself, a group must build its power vis-a-vis the other.
(b) Attempts must be made to bias the rival group's perception of one's comparative strength and of insistence on objectives.

4. Tactics associated with the attitude change strategy are concerned with the following:

(a) Minimizing the perceived differences between the groups' goals and between characteristics of members of the two groups.
(b) Engaging in peaceful communications.
(c) Refraining from actions harming the rival group.
(d) Minimizing or eliminating perceptions of potential threats.
(e) Emphasizing the mutual dependence between the groups.
(f) Enhancing the status of representatives of the rival group and ensuring contacts on an equal basis.
(g) Increasing the involvement in intergroup contact.
(h) Attempting to achieve a high degree of empathy with respect to motives, expectations, and attitudes.

5. The decision makers are faced with a number of issues centering about the contradictions, dilemmas, and choice points implicit in the distinctions between the two major strategies, to wit:

(a) Overstatement of objectives vs. deemphasizing differences.
(b) (Regarding stereotyping): internal cohesion vs. accurate differentiation.
(c) Emphasis on power to coerce vs. trust.
(d) (Regarding information): ambiguity vs. predictability.

(e) Threat vs. conciliation.
(f) (Regarding hostility management): impact vs. catharsis.
(g) Coalition vs. inclusion.

6. Methods of coping with the dilemmas include:

(a) Sequencing or alternating the measures reflecting the two strategies.
(b) Having different persons or subgroups implement the different strategies.
(c) Minimizing the adverse effects of a given strategy by reducing elements of difference in their application.

7. Recognition of the dilemmas associated with strategies in conflict situations has implications for the training of group leaders advocating major social change.

257

INNOVATION DIFFUSION
Adoption factors
Organizational change: industrial

CASE STUDY-ANALYSIS

Walton, R. E. The diffusion of new work structures: Explaining why success didn't take. *Organizational Dynamics,* 1975, 3, 3-22.

Purpose

The author has studied a sample of organizations that made early attempts at the redesign of work with a view toward determining: "How much diffusion has occurred, particularly within the same firm? What are the vehicles for diffusion? What barriers are encountered? How does the character of the innovation affect the rate of diffusion?" He has considered, as well, how answers to questions such as these can help in formulating better diffusion strategies and tactics.

Method

The characteristics of the eight firms studied were analyzed in terms of a seven-step model; problem areas in and barriers to diffusion were enunciated; and attributes of innovations influencing adoption rate as suggested by reviews of the recent literature were noted.

Findings and Conclusions

1. Of the eight firms studied, two are in the United States, two in Canada, one in Great Britain, two in Norway, and one in Sweden. In seven of the instances an important similarity existed in that one unit of the firm was regarded as a pilot project from which the larger organization could learn. The work restructuring approach in the eight cases embraced many aspects of work, including the content of the job, compensation schemes, scope of work responsibility for supervision and decision making, social structure, and status hierarchy. In general, the design was intended to contribute to an internally consistent work culture—one that *appropriately* enlarges workers' scope for self-management, enhances their opportunity for learning new abilities, strengthens their sense of connectedness with co-workers, increases their identification with the product and manufacturing process, and promotes their sense of dignity and self-worth.

2. The generalized model of change efforts applied to the description of the eight "experiments" included seven aspects or steps as follows:

(a) Initiation of the pilot experiment.
(b) Inclusion of pilot experiments judged successful after a year or two.
(c) Recognition and provision of resources for further work restructuring.
(d) Arousal of more general interest in work restructuring.
(e) Extension of change agents' intervention throughout the corporate system.
(f) Development of facilitative networks.
(g) Transfer of experienced personnel from the innovative unit.

3. The *extent of diffusion* that occurred within the eight firms varied widely. In four companies, diffusion was found to be nonexistent or small. In

three companies, somewhat more diffusion occurred; however, the rate either has been slow or it has not been sustained. Only in one company was diffusion truly impressive.

4. In the attempt to find out why diffusion was not more rapid and extensive the following *problem areas* are discussed:

(a) *Regression in the pilot project.* Emergent weaknesses in the pilot project can erode initial support for change; there is not always a correlation between initial project success and diffusion. Several factors have been noted as causing a successful early experiment to deteriorate:
  (1) Internal inconsistencies in the original design.
  (2) Loss of support from levels of management above the experimental unit.
  (3) Premature turnover of leaders, operators, or consultants.
  (4) Stress and crises leading to more authoritarian management.
  (5) Tension in the innovative unit's relations with other parties—peer units, staff groups, superiors, labor unions.
  (6) Letdown in participants' involvement after initial success with its attendant publicity.
  (7) Isolation of the original experiment and its leader from other parts of the organization.

(b) *A poor model for change.* The pilot project may lack either visibility or credibility. Characteristics inherent in the site of the initial experiment may affect its ability to stimulate further change. The way the project leaders present the experiment to others in the firm influences its visibility and credibility. It should be noted that a low profile reduces the career risks associated with possible failure.

(c) *Confusion over what is to be diffused.* Higher management can "botch up" the process in the way they formulate and communicate the diffusion policy even as regards successful projects. The form of work structure may be dismissed as abstract, or action may be delayed because managers do not know how to translate the concepts presented. It may be rejected as inappropriate by managers whose units have different types of work forces, different technologies, or different economic conditions. Diffusion may proceed less rapidly when managers stress particular *techniques* in contradistinction to a clear policy as to *aims,* such as making better use of the talents of employees.

(d) *Inappropriateness of the concepts employed.* The concepts must be realistic as well as "inspiring." For example, in certain instances "autonomous groups" and "equal status" were not found feasible.

(e) *Deficient implementation.* Follow-through may be inadequate in terms of locating accountability for the change and providing "how-to" knowledge.

(f) *Lack of top management commitment.* In some cases, inconsistencies in higher management behavior weakened diffusion efforts. Priority for the innovation at times declined because of changes in industrial relations or business competitiveness, or because of pressures for volume and cost objectives placed upon middle management, or because of rapid expansion and revolutionary change in raw materials and processes used.

(g) *Union opposition.* Unions have influenced the basic climate for change, have complicated the change process by requiring consensus-seeking efforts, and have affected the preconditions for change or limited the nature of the change itself, such as job security and jurisdictional boundaries. At times the effect has been positive, helping to legitimize work restructuring or entering into an informal problem-solving pattern consistent with the work culture sought by the restructuring experiment.

(h) *Bureaucratic barriers.* Diffusion efforts may be frustrated by vested interests and existing organizational routines that limit autonomy. Tensions may arise during the initial experiment and its later diffusion. One problem relates to the level at which decisions are made in the line organization. The method for judging operator qualification for increased pay may prove troublesome, as are other issues affecting personnel status.

(i) *Threatened obsolescence.* New roles and skills may make others obsolete, particularly as applied to first-line supervision. Resistance is not always due to direct threat to roles, but to resentment over the elevation of the blue-collar worker's status in comparison to that of the supervisor.

(j) *Self-limiting dynamics.* A tendency toward "self-sealing" may occur where a single small unit is exclusively involved in the

original experiment and a "star-envy" phenomenon is created by excessive publicity. Differences in the rewards of the original as against the subsequent users of the innovation may prove self-limiting. Those outside the original experiment may lack the original commitment. Rivalry may shift focus from essentials to minor differences in work processes: Where frictions develop in the course of the experiment or its diffusion, an avoidance reaction may set in for fear of hurting one's career.

5. *Attributes of innovations* that may plausibly influence their adoption rates as gleaned from recent reviews of the literature are presented under the following headings:

(a) Relative advantage
(b) Communicability
(c) Compatibility
(d) Pervasiveness
(e) Reversibility
(f) Number of gatekeepers

6. The author concludes his article with a number of observations:

(a) An important reason for the unimpressive rate of diffusion in the eight companies studied is that the innovations had many attributes that made their diffusion inherently slow, such as low communicability and incongruence with existing norms and values.

(b) A further reason relates to barriers the diffusion efforts encountered and the efficacy of the companies' strategies and tactics.

(c) Careful planning is required to assure positive results.

(d) The problems of increased local autonomy and threatened roles are not easily resolved.

(e) The self-limiting dynamics of pilot projects are often unexpected; awareness may lead to greater success.

(f) While the author expects relatively little diffusion of potentially significant restructuring in the workplace in the short run, he is hopeful that for the long run, future experiments will profit from the pioneering efforts.

258

INNOVATION: HIGHER EDUCATION

Planned change: utopian

CASE ANALYSIS

Watson, Goodwin. Utopia and rebellion: The new college experiment. In M. B. Miles (Ed.), *Innovation in education.* New York: Bureau of Publications, Teachers College, Columbia University, 1964, pp. 97-116.

Purpose

The author undertakes to identify the attributes of communities which are designed to incorporate an ideal state of affairs—that is, utopian communities.

Method

The generalizations which are advanced are drawn from the experiences of New College, established in 1932 at Teachers College, Columbia University. New College existed for 7 years and enrolled approximately 300 students. Its utopian aspects included individual guidance, no uniform credit ladder, emphasis on individual projects rather than lectures, work program and study in a foreign country, extended contact with children, close relations among students and with faculty. The experiment was periodically embattled, was abruptly terminated, and despite a rebellious attempt by students and faculty to save it, was not revived. Its history suggests to the author a number of utopian characteristics.

Findings and Conclusions

1. Typically, a utopian community puts into practice ideas which have been around for a long time; the discrepancy between what people profess

and what they actually do provides the initial impetus.

2. Utopias spring up in clusters during certain historic periods. The social milieu which gives rise to one such experiment usually stimulates others.

3. Most utopias center about a strong, benevolent father figure.

4. Founders of utopias have usually sought some place where they would be free from expectations and pressures to conform to the norms of an established culture.

5. Utopias tend to attract people who want to read, to meditate, and to discuss ideas; often these people are inept at handling practical, everyday tasks.

6. Many participants in utopian communities are motivated by rebellion against restrictions of the established order. They tend to be alienated, iconoclastic, and eccentric, and are accordingly ill-adapted to community life.

7. Because they are often completely cut off from the external environment and from former personal ties, the members of a utopian community are highly dependent on one another.

8. Living arrangements within a utopian community are often improvised and tentative and generate feelings of insecurity; accordingly, there is a high rate of defection.

9. Utopias are generated in a spirit of ferment which often pervades and splinters the new community.

10. Most utopias are beset by financial worries.

11. Utopias are characteristically isolated—free from restraints but also cut off from potential sources of external support.

12. The larger external community tends to view the utopian experiment with ridicule and sometimes with hostility.

13. Members of a utopian community tend to minimize the dangers of external hostility.

259

RESISTANCE TO CHANGE

Innovation factors
Resistance reduction

ANALYSIS AND SUGGESTIONS

Watson, Goodwin. Resistance to change. In G. Zaltman (Ed.), *Processes and phenomena of social change.* New York: Wiley, 1973.

Purpose

To examine various aspects of resistance to change, to outline five stages in the cycle of change, and to discuss two areas where resistance to change is encountered: the human personality and the human organization. Thirteen suggestions are given for understanding resistance to change.

Method

The author draws on social science literature and on his own experience in social change. He develops his own framework and makes suggestions for dealing with resistance to change.

Findings and Conclusions

After reviewing classical works on resistance to change, the author outlines five stages in the cycle of change. At first only a few pioneers take change seriously, and resistance appears massive and undifferentiated. In the second stage, forces for and against change are identifiable. Conflict and a showdown occur in the third stage, where accurate understanding can make the difference between successful innovation and resistance. In the fourth stage, the supporters of change take power and must deal with perhaps threatening opposition. In the final stage, the erstwhile proponents of change, or the formerly innovative practice, have become the conservative forces, resisting new change.

Watson next discusses aspects of resistance to change which occur in the personality of the individual. He cites research conducted within each aspect. The areas are:

(a) homeostasis
(b) habit
(c) selective perception and retention
(d) dependence

(e) illusion of impotence
(f) superego
(g) self-distrust
(h) insecurity and regression
(i) deprivation and anxiety
(j) other personality factors

Resistance to change also occurs (simultaneously) within social systems. Again the author discusses the basic concepts and cites research in each area. He covers:

(a) conformity to norms
(b) systemic and cultural coherence
(c) the sacrosanct
(d) rejection of outsiders
(e) hierarchy
(f) affluence and leeway
(g) restricted communication
(h) nature of the innovation

With regard to the following points, the author makes suggestions to reduce resistance to change:

Who brings the change?

1. Those involved should feel that the project is their own.

2. The project should have wholehearted support from top officials of the system.

What kind of change?

3. Participants should see the change as reducing rather than increasing their present burdens.

4. The project should accord with values and ideals held by the participants.

5. The program should offer the kind of new experience that interests participants.

6. Participants should not feel threatened.

How is it best done?

7. Participants should join in the diagnosis.

8. The project should be adopted by consensus.

9. Proponents should empathize with opponents, recognize valid objections, and try to relieve unnecessary fears.

10. Innovations may be misunderstood or misinterpreted, so provision should be made for feedback and clarification.

11. Participants should experience acceptance, support, trust, and confidence in their relations with one another.

12. The project should be open to revision and reconsideration if experience indicates that changes may be needed.

13. Readiness for change gradually becomes characteristic of certain individuals, groups, organizations, and civilizations. There emerges a climate for change.

260

PLANNED CHANGE
Organizational factors
Change strategies

ANALYSIS AND SUGGESTIONS

Watson, G., and Glaser, E. M. What we have learned about planning for change. *Management Review*, 1965, 54(11), 34-46.

Purpose

This article spells out possible steps management can take to facilitate a change within an organization.

Method

The authors draw upon their own experience, their knowledge of the relevant literature and a research study conducted by Dr. Glaser, "Utilization of Applicable Research and Demonstration Results," to suggest specific methods for effectively implementing organizational changes.

Findings and Conclusions

The major findings are as follows:

1. Within an organization there are conflicting pressures for both stability and change. Those who want to keep things the way they are usually want to conserve what they are sure of while those who favor change are usually striving for improvement

or gain. The pro and con forces need to analyzed in order to assess their strengths, select specific points on which to concentrate, and define possible hidden allies who may be in favor of the change.

2. Bringing about an orderly change requires leadership from persons in influential positions within the organization or from an outside consultant who can gain the trust of those concerned, including the relevant rank-and-file personnel. The planning of change should, where feasible, be shared by those who will be most affected by it. Work groups often are highly resistant to changes imposed from above or from outside.

3. Extensive fact-finding and analysis are often necessary before the underlying malfunctions can be identified. Pressure for prompt action before the necessary planning is completed, and staff defensiveness during the fact-finding and planning stages are two of the possible barriers to an orderly change.

4. After the diagnosis of the difficulty, the next need is to generate proposals for solving it. Inviting suggestions from members of an organization, becoming familiar with what other organizations have done in efforts to solve similar problems, and taking time away from the usual responsibilities in order to seek a new perspective were all suggested as methods of generating solutions. The authors also indicated that the objectives to be achieved should be clearly stated and broad guidelines for achieving them established.

5. The next suggested step was to schedule the best possible use of available resources of people, money, and sometimes equipment. The authors believe that human resources for planning change, such as top management, other individuals with informal prestige, and the rank-and-file members of an organization . . . are often neglected or misused.

6. The need for a favorable, open-mindedly receptive company climate was stressed. If adverse conditions exist then some relevant type of "climate training" may need to precede the introduction of change. The following steps may be worth consideration: (a) make clear the needs for change, or provide a climate in which others feel free to identify such needs; (b) permit, encourage, and obtain relevant group participation in clarifying and expanding the concept of these needs; (c) state the objectives to be achieved; (d) establish broad guidelines for achieving the objectives; (e) leave the details of change planning to the parts of the organization that will be affected by the change and/or must implement the plan; (f) indicate the benefits or rewards to individuals and to the group expected as a result of successful change; and (g) materialize the benefits or rewards; i.e., keep promises.

7. When faced with resistance to change, frequently (but not always) the wisest and most effective course of action is to focus on reducing resistance rather than trying to overwhelm it. A pilot experiment often may be helpful before large-scale institution of a change.

8. The balance relationships throughout the given organization should be considered in order to prevent negative side effects from appearing in areas that are not directly connected with the department or portion of the total system where changes are being introduced.

9. The *fait accompli* where the situation or operation is changed by responsible authority, before attempting to bring about the desired attitude change, was suggested as an effective method in situations where there is a heavy "loading" of irrational prejudice. In these instances change may be more likely to come about if imposed from the top.

10. In order to maintain the changes, a procedure for periodic review and revision is needed. A breathing spell to consolidate the gains made by the organization before launching other innovations may be desirable.

261

PLANNED CHANGE: EDUCATION
Change strategies
Change: historical comparison

EMPIRICAL STUDY

Wiles, Kimball. Contrasts in strategies of change. In R. R. Leeper (Ed.), *Strategy for curriculum change.* Washington, D.C.: Association for the Supervision of Curriculum Development, 1965, pp. 1-10.

Purpose

The author compares the assumptions underlying directed change efforts in education prior to 1957 with the assumptions underlying directed change efforts after 1957.

Method

The ideas in this paper are based on the broad experience and observations of the author.

Findings and Conclusions

1. The differences between the two periods are in part reflections of increased mass media exposure. The general public is exposed to more ideas and is, in turn, stimulated to promote change in schools. Other differences reflect the increased efforts of the Federal Government to promote change. Strategies for directed change prior to 1957 were based on the various assumptions which influenced curriculum change programs in the late 1950's and early 1960's, such as:

(a) Change in the entire system, state or city, can be effected by adopting a new master plan drawn up by outside experts.
(b) Change in the curriculum is effected most efficiently at the local school building level, and occurs as people change through their participation in decision making related to the curriculum.
(c) Change in the curriculum is produced through in-service education, which develops new teacher perceptions and skills.
(d) Change in the curriculum is effected by: (1) supplying teachers with consultants who assist them with innovation; (2) supplying teachers with new materials of instruction; (3) providing in-service education for the principal which produces a change in his work style; and (4) providing workshop opportunities for key teachers in a building who then become resource persons and leaders for other teachers on the staff.

2. After 1957 new directions are reflected in the assumptions for directed change strategies. The basic attitude underlying the new assumptions is that change should not be equated with chance but with development; and innovation should be linked to long-term goals. The assumptions are as follows:

(a) Some persons in government, foundations, universities, public or private schools, etc., must decide on the desired goals and plan innovations designed to promote them.
(b) Basic research, program design, and field testing should be done by outside forces.
(c) Major instructional innovations should be introduced by the administration because it can marshall the necessary authority and precipitate the decisions necessary for adoption.
(d) The prepackaged instructional system can be introduced despite original opposition or apathy on the part of the teachers.
(e) The informal communication system determines whether formal presentations will be heard.
(f) Real or assumed knowledge of the innovator's identity is a major variable in the acceptance of a particular innovation.
(g) The key to successful innovation is providing assistance to teachers as they begin to implement the adopted programs.
(h) The most persuasive experience that can be provided to convince staffs of the value of an innovation is to make provision for them to visit a successful new program and see it in action.
(i) Due to teacher turnover, a continuous program of in-service education in the skills necessary to implement the innovation must be available for new teachers brought into the system.
(j) The process of change contains three steps—innovation, diffusion, and integration.
(k) Changes in social systems are much more difficult to bring about than changes in individuals or groups.

262

RESEARCH UTILIZATION: SOCIAL SCIENCE
Adoption characteristics
Utilization factors

CASE STUDY

Wilson, Elmo C. The application of social research findings. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science* (Vol. 1). Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 47-58.

Purpose

To explore the extent to which the social science researcher can exert an influence over utilization.

Method

This project is divided in two parts. In the first, the author indicates which factors, with respect to research utilization, the researcher does not control and which are subject to his control. This segment of the study is not summarized herewith, since it adds little to the field. The second portion of the study is a report of a follow-up of a management study carried out for a small, denominational college. The follow-up had been written into the original research contract, and called for the return of the research staff, one year after submission of the report, to find out what progress had been made in applying the findings of the study.

Findings and Conclusions

1. Of the more than 160 specific recommendations, approximately three-fifths had been or were being carried out.

2. In a few instances, the research staff concluded that the original recommendations had not been justified.

3. Of the recommendations which were not being carried out, reasons for lack of implementation could be categorized as follows:

(a) Human relations reasons (inertia, entrenched personal preferences, etc.),
(b) Situations in which the college administration decided to discard the recommendations,
(c) Situations in which the recommendations were not as appropriate as they had originally been, because of subsequent developments in the client situation.

4. The research staff concluded that utilization might have been greater if certain weaknesses in the report had been corrected. These weaknesses included:

(a) The major context of the report was diluted by the inclusion of a number of minor problems.
(b) The report was overburdened by a substantial appendix.
(c) The summarized recommendations were at the end of the report and they would have had more impact at the beginning.
(d) The report did not include an estimate of the comparative costs of the various recommendations, nor a proposal concerning the variable time periods within which it would be desirable to bring them about.

5. The research staff was convinced that the knowledge by the client that a follow-up survey was to be made served as an incentive toward utilization of recommendations.

263

RESEARCH UTILIZATION: AGRICULTURE

Adoption characteristics
Researcher-practitioner collaboration

CASE STUDY

Wilson, M. L. The communication and utilization of the results of agricultural research by American farmers: A case history, 1900-50. In *Case studies in bringing behavioral science into use. Studies in the utilization of behavioral science*, vol. 1. Stanford, Calif.: Institute for Communication Research, Stanford University, 1961, pp. 75-111.

Purpose

This is an account of how the utilization of scientific research has impressively affected the progress of agriculture between 1900 and 1950. Its presentation is based on the assumption that the examples presented will give insight into the general problem of utilizing behavioral science.

Method

The author presents a paper outlining the methods used in getting farmers to put into practice findings obtained in agricultural research. No clear-cut ways of getting useful information from college campuses to farmers had been developed. Making research results easily available was not enough. It also necessitated changes in the farmer's viewpoint, personality, and behavior. The following ways were used in an effort to change the outlook of the farmers and disseminate information:

1. Institutions and channels of communication were developed between farmers and agricultural researchers.

2. As specialized services developed they drew personnel from farm families so that no psychological gulf existed.

3. When farmers saw a successful solution to a serious agricultural problem they became more amenable to other new ideas.

4. The agricultural college course in Iowa was opened to sons and daughters of farmers, and in place of the usual entrance requirements one only needed to be farm-raised and have completed the farm school.

5. Agricultural branches of land-grant colleges consisted of:

(a) Academic work.
(b) Experiment and research—usually "problem research" directed toward problems seen as limiting production or profit.
(c) Extension work—Smith Lever Act in 1914 provided that each state carry on extension work through the landgrant college.
   (1) The county agent organized groups of farmers and aided farmers in helping themselves.
   (2) Extension staff at the campuses sent specialists to county agent meetings with new research ideas and then returned to the campuses with current farm problems.
   (3) 4-H Clubs were founded to present new ideas to children who were not set in their ways.
   (4) Local farm newspapers, booklets, and radio were avenues for broadcasting agricultural information.

Findings and Conclusions

Developments in communication and utilization of results of agricultural research are as follows:

1. Farmers responded, like other producers in a free economic system, to the profit motive. The more they are acculturated to this flow of new information the more easily and profitably it is put into practice.

2. Agricultural communication research will also need to include the problems of motivation, personality, and other complex areas underlying human behavior.

3. Three stages were found to exist in the process of acceptance—

(a) awareness;
(b) interest; and
(c) evaluation leading to trial and ultimate adoption or rejection of the ideas.

4. Personal and social factors affecting adoption of ideas were—

(a) personal prestige;

(b) family behavior;
(c) educational development; and
(d) group and community behavior.

5. Farmers tend to fall into four classes as users of research—
(a) innovators;
(b) early adopters;
(c) informal leaders; and
(d) nonadopters.

6. The more usable information the farmers receive, the more they tend to demand.

264

RESEARCHER-PRACTITIONER RELATIONSHIPS

Organizational factors
Practitioner attitudes
Change agent

ANALYSIS

Wolfensberger, Wolf. Dilemmas of research in human management agencies. *Rehabilitation Literature*, June 1969, 162-169.

Purpose

The discussion focuses on certain important items agency administrators should consider in making decisions about supporting and using research within their agencies.

Method

The paper is an analysis based on the author's observations and experiences, and, in addition, drawing substantially on the literature.

Findings and Conclusions

1. The author presents the following considerations which should be weighed in making a decision to start or support intraagency research.

(a) An underlying assumption should be the presence of tension between the forces of continuity and the forces of change—specifically within what the author designated as human management agencies (that is, those concerned with education, correction, psychiatry, psychology, public relations, rehabilitation, social work). His position is that there is nothing wrong with such tension if agency administrators understand it and use it constructively. One way of reducing the tension is for the administrator to accept as a "given" fact that almost all of his current practices are already outdated.

(b) The administrator should explore his own conscious and unconscious attitudes toward research generally, in his field specifically, and with reference to specific types of research. Is his position: "Research yes, but not here now"?

(c) What problems can the administrator tolerate to see investigated? What are the sanctified areas? Which should be circumvented as fields of research?

(d) Can the agency tolerate controversy and dissent? If not, research is not advisable.

(e) Can the administrator deal with a creative researcher? The researcher may be divergent, a nonconformist. Will he be given leeway to "think the unthinkable, say the unsayable, embrace the unembraceable"? (p. 164).

(f) Administrators (and agency personnel) tend to have an unrealistic idea of how much money, time, manpower, equipment and space research requires. It is suggested that an agency acquire experience concerning the foregoing realities, through internal research, before it seeks external support for research.

(g) The applicability of the research to agency operations may be determined by agency size and organizational structure.

(h) Top-level management must be prepared to dismiss, displace, or demote members of middle management who cannot carry out new research-related policies.

2. The decisions concerning what kind of research to support, and how will involve exploration of the following issues.

(a) The administrator should be willing to look not only at visible problems but at the underlying causes.
(b) A range of roles may be open to the researcher: laboratory oriented; does little research himself but can facilitate the research of others; empire builder; grantsman; more of a resource person than a producer; primarily a teacher and adviser; thinker-innovator who may do little formal research but makes his contribution by theorizing.
(c) What will be the focus of the research? It should reflect the model that prevails in the agency (that is, medical research in a medical agency, behavioral research in a developmental agency, etc.). The author believes that both interdisciplinary and multidisciplinary research are overrated; good interchange depends on chance relationships, not on conscious structuring.
(d) Will the research be basic or applied (the latter to include evaluation)? Basic research tends to isolate agency personnel from the research unit. Applied research, with its implications of change, may induce defensiveness. If applied research is to have maximum chances to be used, the administrator should assure the following conditions:
    (1) The research team must not be administratively subordinate to the person who heads the operations to which the research applies.
    (2) The research operations must be defined as prestigious.
    (3) There must be two-way, face-to-face communication between researchers and those who will be affected by it.
(e) Innovative ideas should be rewarded, *whether they are actually accepted or not.*

3. In a concluding comment, the author points out that in the physical sciences, research almost invariably precedes change. This, he contends, is not true of social sciences, where, in fact, decisions are made which are inconsistent with current research findings. . . . we must learn to control social changes rather than having them control . . . us" (p. 168).

265

KNOWLEDGE UTILIZATION: INDUSTRIAL
Dissemination strategies
Change agency

CASE STUDY-ANALYSIS

Wright, Philip. Technology transfer and utilization: Active promotion or passive dissemination? *Research/Development*, 1966, 9, 34-37.

Purpose

To report on the program of the Office of Industrial Application of the University of Maryland, which seeks to study the transfer to industry of technical knowledge from the National Aeronautics and Space Agency (NASA), and to examine the factors that impede and those that facilitate such transfers.

Method

The first phase of the program is characterized by active promotion of the merit of a selected portion of the NASA technology as a source of new products and processes helpful to industry. The second phase (in progress at the time of publication) has been an effort to trace the outcome of self-generated organizational interest in the technology as a result of publicity in trade journals, NASA's own *Tech Brief* dissemination program, and elsewhere.

Findings and Conclusions

1. Frequently a critical point in the transfer and utilization mechanism is the personal confrontation of the intended user with the innovator. Such

confrontation, if skillfully managed, generates within the user the enthusiasm necessary for embarking on the new endeavor.

2. Major reasons for rejection and inaction were found to be technical, and associated with indeterminate applicability and uncertain market potential.

3. Almost eight times as much interest was generated by the possibility of improving an existing product or process as was motivated by the chance of acquiring a completely new addition to the inquirer's processes and products.

266

INNOVATION-ADOPTION PROCESS

Innovation factors
Organizational factors
Change models

REVIEW OF LITERATURE

Zaltman, G., Duncan, R., and Holbek, J. *Innovations and organizations.* New York: Wiley, 1973.

Purpose

The book is designed to present a selective, organized review of the literature on the innovative-adoption process as it takes place within multimember units of adoption and as related to the environment of the organization. The authors also present their own model for examining the process, and present their list of the attributes that characterize innovations.

Method

The reveiwed literature has been arranged according to a systematic set of topics relative to the innovative process, notably: (1) the nature and characteristics of innovations; (2) the processes of innovation; (3) characteristics of organizations affecting innovation; and (4) theories of innovation in organizations.

Findings and Conclusions

1. Preliminary to the treatment of the subject, the authors present a number of distinctions as to kinds of innovations, such as between programmed and nonprogrammed innovations, instrumental and ultimate innovations, and varying degrees of radicalness of the innovation. Innovation is seen as employed in three different contexts: (a) as synonymous with invention; (b) as the "process whereby an existing innovation becomes part of an adopter's cognitive or behavioral repertoire"; and (c) "as an idea, practice, or material artifact that has been invented or that is regarded as novel independent of its adoption or nonadoption."

2. The authors stress the need to keep the several differentiations in mind while examining studies of the innovative process. Thus, organizations experiencing success will tend to differ from unsuccessful organizations in style and radicalness of innovative behavior. The perceived gap between current and normative performance of an organization is seen as a significant differentiator in innovative behavior.

3. With the reminder that various combinations of attributes are involved with different types of innovation, the following attributes have been found relevant for "describing, explaining, and predicting responses to innovations":

(a) Cost—financial and social, initial and continuing.
(b) Returns to Investment—tangible and intangible.
(c) Risk and Uncertainty—lessened for late adopters.
(e) Communicability—ease of dissemination and clarity of results.
(f) Compatibility—consistency with "existing values, past experiences, and needs of receivers."
(g) Complexity—of ideas and in actual implementation.
(h) Scientific Status—reliability, validity, generality, etc.
(i) Perceived Relative Advantage—its visibility

and demonstrability.

(j) Point of Origin—from within or without the organization.

(k) Terminality—point beyond which adoption becomes less rewarding, useless, or even impossible.

(l) Status Quo Ante—reversibility and divisibility.

(m) Commitment—prior attitudinal or behavioral acceptance.

(n) Interpersonal Relationships—impact on a disruptive-integrative continuum.

(o) Publicness versus Privateness—availability to all members of the social system.

(p) Gatekeepers—number of approval channels.

(q) Susceptibility to Successive Modification—ability to refine, elaborate, or modify innovation.

(r) Gateway Capacity—opening of avenues to other innovations.

(s) Gateway Innovations—instrumental setting of stage for large-scale innovations.

4. The treatment of the *processes of innovation* entails the consideration of: (a) decision processes in innovation; (b) stages of the innovation process; (c) control of the innovative process; and (d) resistance to innovation.

5. Under pressure of perceived performance gaps *decision makers* in an organization are induced to consider innovative alternatives entailing varying degrees of certainty, risk, or uncertainty.

6. The *stages of the innovative process* are presented as follows:

(a) Initiation stage
  (1) Knowledge-awareness substage
  (2) Formation of attitudes toward the innovation substage
  (3) Decision substage

(b) Implementation stage
  (1) Initial implementation substage
  (2) Continued-sustained implementation substage

Variant stage analyses by other writers also are presented.

7. Feedback is depicted as playing a central role in the *control of the innovative process.* A distinction is made between externally and internally generated feedback.

8. Innovations may be *classified* principally according to the specific changes they necessitate in the organization, particularly as regards authority decisions as against collective decisions. The attributes of each type are summarized.

9. Factors affecting *resistance to innovation* are considered in relation to each stage of the innovative process. Among the possible determinants of resistance are: (a) the need for stability; (b) the use of foreign jargon; (c) impact on existing social relationships; (d) personal threat; (e) local pride; (f) felt needs; and (g) economic factors.

Structural factors affecting resistance include: (a) stratification; (b) division of labor; and (c) hierarchical and status differentials.

Individual resistance is related to: (a) perception; (b) motivation; (c) attitude; (d) legitimization; (e) accompaniments of trial; (f) results of evaluation; (g) actual adoption or rejection; and (h) manner of dissonance resolution.

10. The effects of the *characteristics of organizations* on innovation are analyzed in terms of their environments and their structure.

11. Since the organization is not a closed system, changes in the organization or its environment may create stress or pressure. Distinguishing between the internal and external environments, the authors present a number of factors and components that comprise each. These factors need to be taken into consideration as decisions are made regarding innovative alternatives.

12. Differentiating among bureaucratic, cybernetic, and other theories of organization, the authors note the implications for innovation of *organizational structure.* They conclude that there is no one best way to organize, and that "there may be a variety of structural configurations that an organization might implement contingent on the type of situation the organization is facing."

Organizational factors that may affect the innovative process are listed as follows:

(a) Complexity—the number of occupational specialties and their professionalism.

(b) Formalization—emphasis placed within the organization on following specific rules and procedures in performing one's job.

(c) Centralization—the locus of authority and decision making within the organization.

(d) Interpersonal Relations—including degree of impersonality.

(e) Ability to Deal with Conflict—as to whether to innovate and how to innovate; differences in goals, perceptions, etc.; intrapersonal, interpersonal, organizational, interorganizational, etc.

13. The authors present their *theory of the innovation process* at the level of the organization, as

distinguished from that of specific innovative ideas, practices, or material artifacts. In so doing, they relate the organizational factors of complexity, centralization, interpersonal relations, and capability for dealing with conflict to the initiation and implementation stages of the innovation-adoption process. They also relate the nineteen previously enumerated attributes of innovation to the decision stages through which an innovation progresses.

14. Relating others' theories to their own, the authors briefly review several selected theories of innovation, notably those by March and Simon, Burns and Stalker, Harvey and Mills, Wilson, and Hage and Aiken. In comparison with these theories, their own is seen as attempting to focus on the dynamics of the innovative process and to provide guidelines for facilitating *both* the initiating *and* the implementing stages, while the other theories are credited with making contributions to the understanding of various components of the organizational change and innovative processes.

267

RESISTANCE TO CHANGE
Resistance reduction

ANALYSIS AND SUGGESTIONS

Zander, Alvin. Resistance to change: Its analysis and prevention. In W.G. Bennis, K. D. Benne, and R. Chin (Eds.), *The planning of change: Readings in the applied behavioral sciences.* New York: Holt, Rinehart & Winston, 1962, pp. 543-548.

Purpose

The purpose of this article is to define resistance to change in industrial organizations, to identify the conditions that appear to be associated with development of this resistance, and to examine some means whereby resistance may be prevented or decreased.

Method

The author drew on his own knowledge of resistance to change to prepare this paper. No specific method of information gathering is discussed.

Findings and Conclusions

1. There is one common denominator in examples of resistance to change, which might serve as a defense of such resistance. That is, they all show behaviors intended to protect individuals from the effects of real or imagined change.

2. It is the protective function of behavior, rather than specific actions, that identifies resistance. Specific behavior may take many forms.

3. Some conditions conducive to resistance:

(a) Resistance can be expected if the nature of the change is not made clear to the people who are going to be influenced by it. There is some evidence to support the hypothesis that those persons who dislike their jobs will most dislike ambiguity in a proposed change.

(b) Different people will see different meanings in the proposed change. They may see in it an indication that they are doing a poor job, that their office will be abolished, or other personally undesirable causes or effects, which may not be accurate estimates of the situation.

(c) Resistance can be expected when those influenced are caught between strong forces pushing them to make the change and strong forces deterring them from making the change.

(d) Resistance may be expected to the degree that the persons influenced by the change have pressure put on them to make it, and will be decreased to the degree that these same persons are able to have some "say" in the nature or direction of the change.

(e) Resistance may be expected if the change is made on personal grounds rather than impersonal requirements or sanctions.

(f) Resistance may be expected if the change ignores the already established institutions in the group.

4. Resistance will be prevented to the degree that the changer helps the "changees" develop their own understanding of the need for the change, and an explicit awareness of how they feel about it, and what can be done about these feelings.

5. The principle stated in (4) above implies that the administrator can use resistance as an important symptiom. Specifically, he can use the nature of the resistance as an indicator of the cause.

6. There is value in blowing off steam. There is good evidence that new attitudes can be accepted by a person only if he has a chance to thoroughly air his original attitude.

7. Resistance may be less likely to occur if the group participates in making the decisions about how the change should be implemented, what the change should be like, how people might perform in the changed situation, or any other problems that are within their area of freedom to decide.

8. Resistance will be less likely to develop if facts which point to the need for change are gathered by the persons who must make the change. People will be more likely to act in terms of information they gather themselves than in terms of information gathered by others and delivered to them.

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INDEX 1: CHANGE ASPECTS OF THE DEVELOPMENT-DISSEMINATION-UTILIZATION CONTINUUM

Numbers refer to serial number *(not page number)* of summary.

INDEX 2: MODE OR TYPE OF STUDY SUMMARIZED

Numbers refer to serial number *(not page number)* of summary.

INDEX 3: AREAS OF APPLICATION

Numbers refer to serial number *(not page number)* of summary.

END