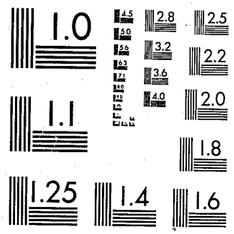

CRIMINAL JUSTICE ANALYSIS

INSTRUCTOR GUIDE

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Law Enforcement Assistance Administration
U.S. Department of Justice
Washington, D.C. 20531
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CRIMINAL JUSTICE ANALYSIS

INSTRUCTOR GUIDE 1979

This document represents a refinement of an earlier LEAA sponsored work by Seth I. Hirshorn, Ph.D., Ann Arbor, Michigan, 1978, which was based on Analysis Course developed by Abt, Associates under LEAA contract, 1976. The work on **Criminal Justice Analysis** was performed under Grant #78-MU-AX-0030 to the Criminal Justice Training Center, Department of Criminal Justice, Washburn University of Topeka.

Refinements of the Analysis Course were performed under the direction of Dr. Hirshorn with Technical Assistance from the staff and faculties of the Northeastern University, University of Wisconsin-Milwaukee, Florida State University, Washburn University, and University of Southern California Criminal Justice Training Centers.

Points of view or opinions stated in this document do not necessarily represent the official position of the Criminal Justice Training Center, the Law Enforcement Assistance Administration or the U.S. Department of Justice.

Richard N. Ulrich, Director Training Division, Office of Operations Support, LEAA served as project monitor.

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The Law Enforcement Assistance Administration is actively engaged in providing assistance to state and local governments to support their administrative capabilities. Good analyses are prerequisite to the development and implementation of effective programs for improving criminal justice and reducing crime. Decision-makers understand that policies and programs must begin with analysis of the crime and criminal justice system problems they face and that efficient utilization of scarce resources can only be achieved by the careful interpretation of available information. In this context analysis is a powerful tool to be utilized in criminal justice planning, program development and management, and evaluation.

The expertise of analysts, planners, researchers, and of greatest importance, people who have had direct personal experience with state and local criminal justice problems has been tapped by LEAA's Training Division to develop and deliver the Criminal Justice Analysis Course. The Criminal Justice Analysis Course concentrates on the specification of crime and system problems utilizing basic statistical and other analytic tools essential to this process. This course is offered to state and local governments to assist and support them in identifying, acquiring, and using the best available data, analytic techniques, and problem-solving methods.

The Analysis Course is a companion to the LEAA developed training courses in Criminal Justice Planning, Criminal Justice Evaluation, and Criminal Justice Monitoring. Other companion courses under development include Criminal Justice Program Development and Program Management. The design of these programs of instruction is intended to form a comprehensive and complementary curriculum of criminal justice tools for planning and decision-making.

The Training Center System for delivering these programs of instruction consists of major universities located throughout the country. Centers are located at the Northeastern University, University of Wisconsin-Milwaukee, Florida State University, Washburn University, and the University of Southern California. Each Criminal Justice Training Center is responsible for delivering these courses and providing technical assistance to jurisdictions within its region.

In June, 1978, LEAA and the five Criminal Justice Training Centers agreed that a "Finalization" of the original analysis course was appropriate. The Criminal Justice Training Center at Washburn University received a grant from LEAA to manage and coordinate the Finalization process. Dr. Seth I. Hirshorn, Ph.D, Ann Arbor, Michigan, the consultant revising the original document, developed by Apt Associates, Boston, Massachusetts, was retained as the principal consultant to perform the major task of synthesizing the suggested course modifications from the five Training Centers, their faculties, and LEAA. The manager for the Finalization project was Allen Beck, Ph.D., Assistant Director of the Criminal Justice Training Center, Washburn University. Project Director was Lyle D. Newton, Director, Criminal Justice Training Center, Washburn. Word Processing was done by Kathy Goldsmith and Tina Sumpter, Criminal Justice Training Center, Washburn University. The Project Monitor was Richard N. Ulrich, Director, Training Division, Office of Operations Support, LEAA.

The Criminal Justice Analysis Course consists of an Introduction and seven modules or instructional units. Each module consists of information and instructions on objectives, content, walk-throughs and exercises, visual aids, and the timing of each portion of the course. The information contained in the Instructors Guide (IG) on content includes references to the criminal justice literature, consideration of related topics, and questions most often raised by participants, as well as detailed instructions for each exercise on how it relates to the preceding instruction, how it is to be briefed and administered by the instructor, and, most important, how it is to be debriefed.

The emphasis in the Criminal Justice Analysis Course is on an interactive, participatory learning environment. A Major Exercise, additional exercises, and numerous walk-throughs have been developed to help insure the achievement of course and module objectives.

It is important that participants be clear as to the purpose of each exercise, the exercise activities, that they have sufficient time for completing each exercise, and attention be given the debriefing of the exercises. A distinction has been made between exercises and walk-throughs. A walk-through is accomplished by the instructor thoroughly explaining a particular procedure to the entire group and affording the group an opportunity for raising questions. In contrast, an exercise requires small group work with the assistance and support of the instructor.

To aid faculty and students in understanding the Criminal Justice Analysis Course, as well as to provide a useful decision-making tool in the conduct of analysis, the course has been elaborated into a flow chart or decision map.* These flow charts provide a guide for organizing the conduct of analysis, classifying the problems worked on, outlining the application of data sources and statistical techniques, and identifying the topics and instructional sequence of the Criminal Justice Analysis Course. The maps provide a graphical integration of the course's instructional units and are to be used by instructors as a reference to the interrelationships between course modules and as an aid for making transitions between modules. They are useful also as summaries of each module and for subsequent reference by participants.

Documentation and detailed materials pertaining to the Criminal Justice Analysis Course are also presented in the accompanying Text. The respective portion of the Text pertaining to individual faculty assignments should be studied by instructors prior to making their presentations as the Text narrative provides additional material for instructor and participant reference.

* For an example of the use of decision maps in statistics see Thad R. Harshbarger, Introductory Statistics: A Decision Map (New York: MacMillan Publishing Co., Inc., 1977).

ORIENTATION

The purpose of the orientation is to provide logistic and background information to participants. The Orientation and Introduction are to be presented as a single unit lasting 60 minutes.

ORIENTATION SCHEDULE

TIME ALLOCATION

* Less than 5 minutes

ORIENTATION MODULE	NOTES
I. PURPOSE OF ORIENTATION	
A. Familiarize Participants with the Training Facility and Surrounding Area	
B. Cover Administrative and Logistical Matters	
C. Acquaint Participant with--	
1. The Criminal Justice Training Center	
2. The Staff and Faculty of the Center	
3. The Other Participants	
4. The Course Material	
II. THE FACILITY AND AREA	
A. Explain Hotel Lay-out	
1. Sleeping Rooms	
2. Meeting Rooms	
3. Food and Beverage Services	
4. Elevators	
5. Parking	
6. Hospitality Room	
B. Explain Area's Restaurants and Other Attractions	
III. ADMINISTRATIVE MATTERS	
A. Explain "Break" Policy	
B. Explain Room Set-up	
1. Smoking vs. Non-smoking	
2. Placement at Tables	
3. Use of Name Cards on Table	
C. Appropriate Dress	
D. How to Complete Travel Vouchers	

E. Continuing Education Credits

F. Course "Evaluation" Procedures

IV. CRIMINAL JUSTICE TRAINING CENTER

A. Explain the Training Center's University Placement and Line of Accountability

B. Financed by LEAA Grants to Provide Training and Technical Assistance

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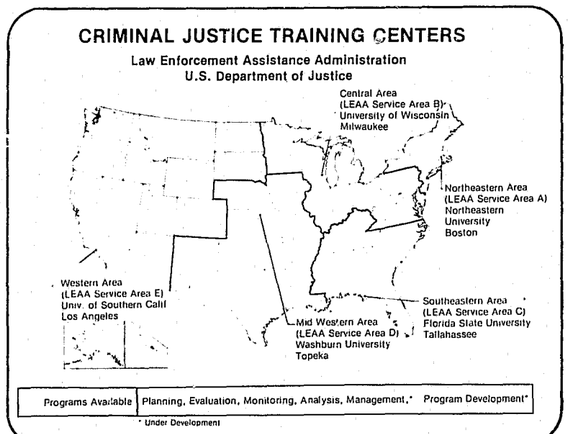
SHOW V.A. (O-1):



EMPHASIZE (O-1):

+ Describe System of Five Centers

+ Describe Current Array of Course Offerings

+ Project Future Course Offerings and Services

C. Describe Target Audience for Courses

1. State, Regional, and Local Criminal Justice Planning Unit Staff

2. Operational Agency Planners, Analysts, Evaluators and Monitors

V. STAFF AND FACULTY

A. Prepare and distribute hand-out describing backgrounds of key Center staff and all instructors, introducing those present.

B. Point out mix of background and skills and balance between academic and practitioner experience.

VI. PARTICIPANTS

A. Refer to Roster and Request Corrections

B. Describe Method of Selection of Participants

C. Have the participants pair off and tell them to spend the next few minutes interviewing each other. At the end of the interviews tell them they will introduce their partners giving the name, agency, position, function, length of time in the field, and three expectations for the week.

D. Summarize Group's Characteristics

VII. COURSE MATERIALS

A. Participant Guide

Instructor Should Explain the Organization and Format of the Participant Guide (P.G.)

B. Visuals

Visuals consist of photo negative (white on black) overhead projections. Generally there will be no need to lower normal room lighting. Other visuals include the "module charts" at the end of each module and a wall chart of each "module chart".

C. Glossary and Bibliography

Explain that the Glossary and Bibliography have been developed for all Training Center programs. Note their location in the P.G.

INTRODUCTION

The opening session of the Analysis Course must accomplish several things in order for the participants to effectively move through the lessons and tasks of the week.

First, the participants must have a clear understanding of the methods, procedures, and objectives of the course. Because of the complexity of the course, it is imperative that faculty, facilitators and participants have a common understanding of the expected product and the steps to be taken to produce that product. Anything less than total understanding and agreement will result in confusion.

The course overview establishes goals, identifies the participants, identifies themes, and discusses the values or purposes of analysis. Finally, the overview establishes that analysis is a process leading to a statement of problems which serve to inform decision-makers.

The course materials are described and discussed. The Problem Statement from Module 1, which has been sent to participants as a pre-reading, is presented as the product of a well managed analysis project. The statement should be used as an example of the product which should result from the Major Exercise.

The final activities of the opening session are to provide an orientation to the Major Exercise.

INTRODUCTION

TIME ALLOCATION

OBJECTIVES
INTRODUCTION

1. To describe the method, procedures, and objectives of the course.
2. To establish goals, identify participant backgrounds and to identify themes for the course.
3. To identify the values or purposes of analysis.
4. To establish that analysis is a process to aid in decision-making.

NOTES

I. COURSE OVERVIEW

A. Course Goals

1. Knowledge Goal:

The participant should understand as a result of this course the purpose and logic of analysis as used to formulate crime and criminal justice system problems which are used to influence decision-making.

Emphasis is on problem formulation as distinct from strategy assessment.

2. Skill Goal:

The participant will be able to select and apply analytic techniques to crime and system data that can lead to improved interpretation of the data and more effective communication of information, thus providing decision-makers with information which they can understand and use in decision-making.

3. Attitude Goal:

Participants with minimal prior analytic training, regardless of preconceived ideas of their quantitative talents, will perceive data analysis as being within their competencies and the use of analytic methods as meaningful and desirable.

In many respects the Criminal Justice Analysis Course provides a setting for overcoming the "intimidation factor" many feel toward criminal justice data analysis.

B. Course Participants

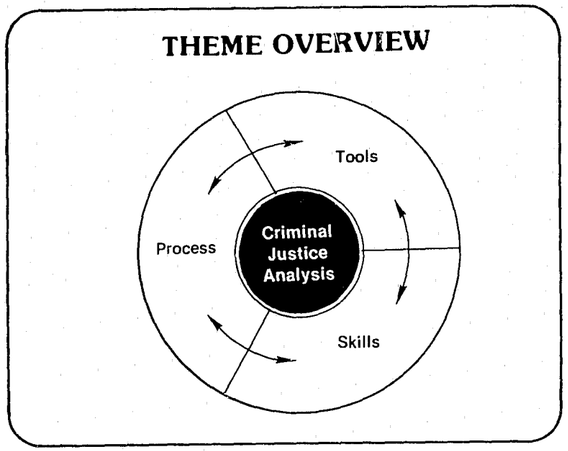
1. The introductory nature and goals of the course indicate that it is for those who seek to understand the analysis process and gain knowledge of how to apply basic analytical tools used in formulating crime and criminal justice system problems.

2. The participants should include planners, budget analysts, program coordinators, policy analysts, program developers, program monitors -- anyone that informs decision-making in criminal justice agencies.

C. Course Themes

The Analysis Course has three distinct, yet integrated themes.

SHOW V.A. (IN-1):



EMPHASIZE (IN-1):

+ Analysis as a process includes four general parts:

  (1) Problem Specification

  (2) Data Selection and Collection

  (3) Extraction of Information from Data

  (4) Persuasive Presentation of Information

+ Analysis as a set of tools means an understanding of the use, applications, strengths and weaknesses of analytic techniques and statistical procedures.

+ Analysis as a set of skills means how to select, use and manage the tools of analysis effectively.

D. Values or Purposes of Analysis

1. Analysis is an integral part of criminal justice and plays a key part in informing decision-makers.

   a. Unique tasks in LEAA delivery system require analysis (e.g., allocation of funds by geographical area, review of competing proposals).

   b. Problem analysis requirements of Guidelines (Re: Chapter 6, Paragraph 61, Page 105; Chapter 3, Paragraph 35, Page 38.)

   c. Analysis is used as input to decision-makers.

      (1) If analyst's work is relevent to the decision-maker's needs, understandable and persuasive, it should have an impact.

      (2) Hundreds of "minor decisions" aren't exclusively "political" and analytic products may be influential in many.

      (3) Good analysis may help decision-maker out of a political trap if he or she is caught between equally strong interests.

2. Competencies central to the role of the analyst include:

   a. Data Collection and Interpretation

   b. Technical Assistance

   c. Written Communication

   d. Oral Communication

   e. Formal and Informal Communication

   f. Interpersonal Skills

   g. Leadership

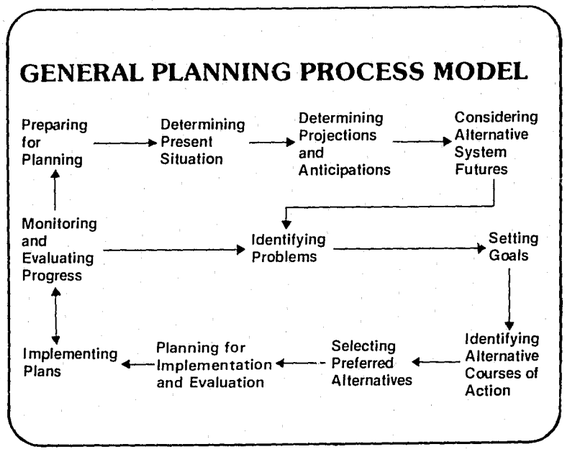
   h. Decision-Making Influence

Instructor might ask participants their role perceptions instead of listing these items and work the group toward these. Another role perspective that should be brought up -- emotional decision making (affective style) vs. decision making based on facts (cognitive style).

Rewrite WITH FULL CITATION

3. Analysis is an Integral Part of Planning Process

SHOW V.A. (IN-2):

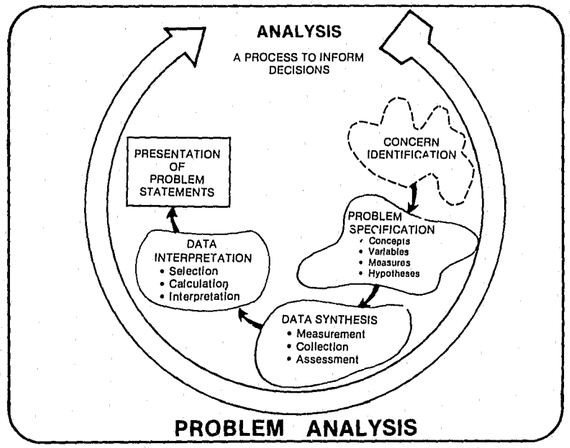


EMPHASIZE (IN-2):

+ In the general planning model, analysis begins in the stage of preparing for planning and results in the identification of problems.

+ Analysis may also occur during the phases of identification/selection of alternatives and monitoring/evaluation.

SHOW V.A. (IN-3):



EMPHASIZE (IN-3):

+ Explain that this model, which outlines the week of instruction, is used to generate effective problem statements.

+ It presents the concept of a problem statement as a product of the analysis process. The content of a problem statement, which the participants have reviewed in the pre-mailing and which will be examined in Module 1, and the process of its preparation and presentation constitute the Criminal Justice Problem Analysis Course.

+ Note especially that this process is oriented toward influencing decision-makers, and is not viewed as either an abstract or academic exercise.

E. Process as Roadmap

1. This week we'll follow the analysis process used to prepare a problem statement.

2. The movement will be from identification of concerns and specification of problems to the development and presentation of a good problem statement.

3. Exhibit 1 is a preview of the entire course.

   a. A rectangle will always be used to present an instruction or information.

   b. Diamond-shaped figures will always be used to indicate decision points, or places where choices must be made.

   c. Arrows will indicate the direction of the flow.

4. A decision map will be elaborated for each module and utilized throughout week. It is called the module's chart.

5. Exhibit 2 is the course agenda.

   a. Break times indicate the approximate amount of time available during each morning and afternoon session and not the location of breaks. These need to be programmed by the Training Centers and instructors.

   b. The course has approximately 34.5 hours of activities. The program does, however, require close adherence to the agenda. Program Managers, faculty and especially facilitators will find it necessary to carefully monitor activities in order to stay on schedule. Special attention should be paid to Thursday afternoon. Failure of the work groups to deliver a product from Tasks 3 and 4 in the late afternoon or early evening will prevent the facilitators from preparing adequately for Task 6 of the Major Exercise.

[redacted] Analysis

Exhibit 1. [redacted]

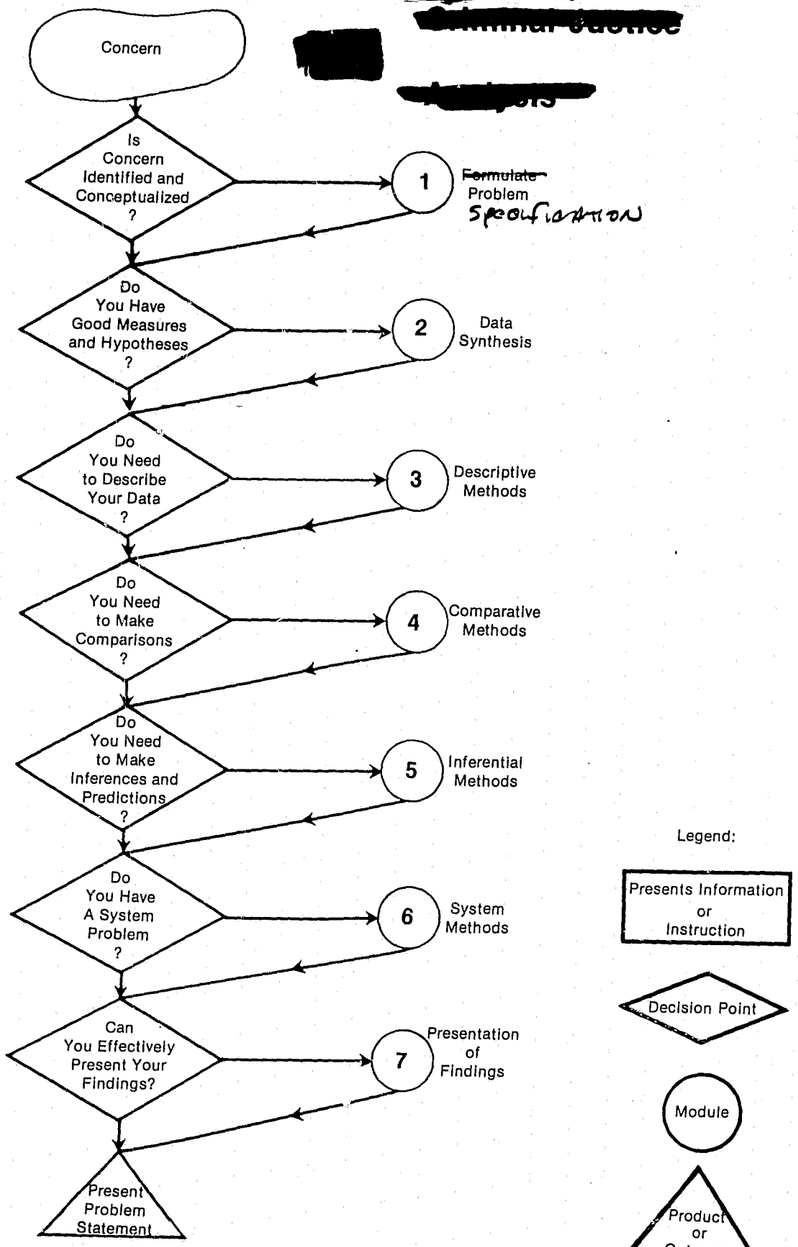


Exhibit 2

CRIMINAL JUSTICE ANALYSIS COURSE AGENDA

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30 A.M.		Module 1 Problem SPECIFICATION (90 minutes)	Module III Data Interpretation - - - Descriptive Methods (180 minutes)	Module V Data Interpretation - - - Inferential Methods (180 Minutes)	Module VI Data Interpretation - - - System (120 minutes)	Major Exercise Task #5 (60 miutes)
		Module II Data Synthesis (90 minutes)			Module VII Presentation of Findings (90 minutes)	Major Exercise Task #6 (180 minutes)
12:00		Lunch	Lunch	Lunch	Lunch	End of Session (60 minutes)
1:30 P.M.		Major Exercise Task #1 (120 minutes)	Module IV Data Interpretation - - - Comparative Methods (180 minutes)	Module V Data Interpretation - - - Inferential Methods (continued) (120 minutes)	Major Exercise Task #3 (120 minutes)	
		Major Exercise Task #2 (90 minutes)	Major Exercise Debriefing (60 minutes)	Calculator Workshop (90 minutes)	Major Exercise Task #4 (120 minutes)	
5:00 P.M.	Orientation/ Introduction (45 minutes)					
	Managing Analysis (70 minutes)					

IN-10-16

NOTES

c. Indicate that the course consists of approximately 19 hours of lecture including 13 walk-throughs in which the instructor and the facilitators lead group discussion of a particular procedure, and 8 exercises including the Major Exercise lead by the facilitators. Approximately 11.5 hours of the 34.5 hours are devoted to the Major Exercise.

d. In addition to the overhead format, visual aids are available in a 24" X 48" easel format at the program managers option. These oversize charts can be taped to the classroom wall for a continuing reminder of the process of analysis.

MANAGING ANALYSIS

This optional module emphasizes management skills essential to planning and implementing moderate and large-scale analysis projects. The presentation of management skills should focus on the development, interpretation and utilization of various techniques. The procedures covered in the module include methods for tasking a project and labor and resource allocation procedures.

It is recommended that if this module is used in the course, its most advantageous position is on Sunday evening following the Introduction. However, it can be offered on any evening following the training day at the Training Center's discretion.

It is an optional module in the sense that Training Centers must decide whether the module is to be covered. This decision should be made in light of an understanding of participant needs and interests, time pressures and instructional staff availability.

OBJECTIVES

1. Use specific techniques for managing analysis tasks.
2. Describe the benefits from planning an analysis effort.

SCHEDULE

MANAGING ANALYSIS

TIME ALLOCATION

* Less than 5 minutes

MANAGING ANALYSIS

NOTES

I. ANALYSIS PLAN

A. Definition:

1. An analysis plan is a written document which systematically outlines the major components of the analysis task from the initial statement of the analytic concern to a work plan which includes an estimate of the costs of a proposed investigation. (See Exhibit 1)

B. Need for an Analysis Plan

1. Pre-preparation of an analysis plan for any sizeable analysis task is necessary to produce results which are reliable and efficiently produced. Such preparation is almost certain to produce better results than those analyses which are not based on a plan. Analysis plans force the analyst to consider why a particular analysis is worth undertaking, what needs to be analyzed, how the analysis will be undertaken, when and by whom, and to whom and how the results should be transmitted.

2. Inefficiency and missing opportunities characterize approaches which are not scientifically based and are merely "data grubbing" efforts or based on vague ideas of need.

3. Sometimes development of an analysis plan is mandatory. Budget requests or grant applications, whether for federal funds such as LEAA planning funds or for foundation funds, are essentially an analysis plan.

C. Developing an Analysis Plan

1. There are obviously many possible ways of organizing an analysis plan, but the major components generally tend to be similar. The process should be thought of as a flow with steps overlapping and feeding back into each other. The components of the final analysis plan represent the product of this process.

Exhibit 1

Analysis Plan Development,
Components, And Uses

ADDITIONS TO Come

STAGES IN DEVELOPING AN ANALYSIS PLAN	State concern for which analysis is needed	Specify concepts, variables, hypotheses	Measure variables and assess hypotheses	Identify & select data sources	Select analysis techniques	Identify audience and use for findings	Select presentation format & dissemination procedure	Determine target manpower, equipment & time needed	Estimate costs
ANALYSIS PLAN COMPONENTS	Questions to be answered	Problem Specification	List of Concepts, variables, measures, & hypotheses	Data collection plan	Selected analysis techniques	Audience identification & use for products	Presentation and dissemination plan	Tasking, Labor allocation	Costing
USE (WHAT EACH STAGE TELLS THE ANALYST)	WHY	WHAT	WHAT	HOW	HOW	FOR WHOM	FOR WHOM	WHEN & BY WHOM	HOW MUCH
MODULE REFERENCE	MODULE 1: PROBLEM SPECIFICATION		MODULE 2: DATA SYNTHESIS		MODULES 3,4, 5, 6: METHODS OF ANALYSIS	MODULE 7: PRESENTATION OF FINDINGS		MANAGING ANALYSIS	

a. Problem Specification

1) Identifying Concerns

2) Conceptualizing Concerns

3) Elaborating Concepts into Variables

4) Establishing Measures for each Variable

5) Postulating Hypotheses

b. Data Synthesis

1) Assessing and Selecting the Hypotheses

2) Collecting the Necessary Data

c. Interpreting the Data Using:

1) Descriptive Methods

2) Comparative Methods

3) Inferential Methods

4) System Methods

d. Persuasive Presentation of:

1) A Written Report

2) An Oral Briefing

D. Work Plan--Putting the Analysis Together

Explain the management problem associated with performing analysis. This essentially consists of four interrelated factors:

1. Quality Control

This requires constant monitoring of the process and careful elaboration of tasks and milestones.

2. Staff Relations

Planning and implementation of who does what, when.

3. Budget Control

Planning and monitoring of expenditures/resources.

4. Client Relations

Developing usable products, responsive to your audience's needs. Module 7 emphasized this last responsibility. This module is concerned with the first three responsibilities.

II. WORK PLAN

A. Overview

1. One of the most important aspects of analysis is the Work Plan for managing the analysis. Scheduling and resource allocation are needed to ensure that the analysis task actually gets done, is completed on time, and is of high quality.

2. A number of management tools are available to assist in this task. These tools help answer:

a. What tasks, and in which sequence, are required to complete the analysis?

b. How much and what types of manpower are needed?

c. When are the various skills needed?

d. Will delays in any of these analysis tasks hold up completion of the final product?

SHOW V.A. (Mgt.-1):

STEPS IN DEVELOPING WORK PLAN

1. Identify tasks to be performed
2. Identify relationships among tasks
3. Determine type and magnitude of resources required for each task
4. Determine major milestones and target dates
5. Prepare time schedule for use of resources to perform tasks

NOTES

EMPHASIZE (Mgt.-1):

+ Step-by-Step Process

+ Interdependent Steps

+ Numerous Tools Exist to Assist in this Effort

B. Tasking

1. Tasking refers to the sub-division of the analytic activity into a sequential series of tasks to be performed.

2. Proper tasking is an important aspect of quality control, particularly the scheduling of tasks.

3. Two methods for scheduling tasks are the Gantt Chart and the PERT technique.

a. Gantt Chart

1) A Gantt Chart is a graphical representation of project tasks in relation to each other and in relation to time.

2) The Gantt Chart can assist the analyst by formalizing time goals, disaggregating analytic tasks, and permitting a comparison to be made between the planned versus the actual progress of the analysis tasks.

3) Characteristics of the Gantt Chart presented in Exhibit 2 are:

- Rows are activities. Activities should be reduced to discrete tasks.

- Columns are months

- Month 6 gap provides for slippage

NOTES

- Use of months as the time interval automatically builds in for a four week slippage factor over the year. To correct for this as well as to provide a more detailed schedule, the preferred time interval on a Gantt Chart is the week rather than the month.

- Products are indicated with a triangle.

- Lines indicate the starting time, duration, and completion time of each task.

4) Exhibit 3 presents a weekly Gantt Chart of the same project which adjusts for the time gaps in the months.

5) A limitation of the Gantt Chart is that it does not indicate which activities must be completed before others can begin or which sequence of tasks should be given highest priority.

Exhibit 2.

GANTT CHART

State Analysis of Local Crime Reduction Program Impacts by Month

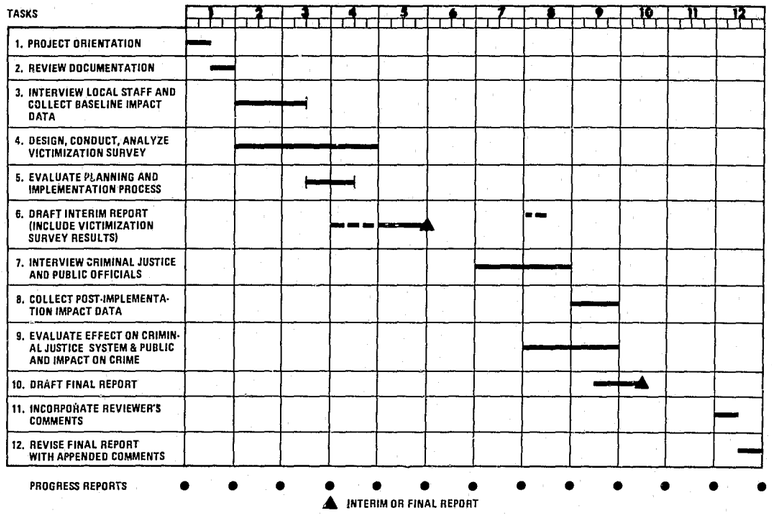
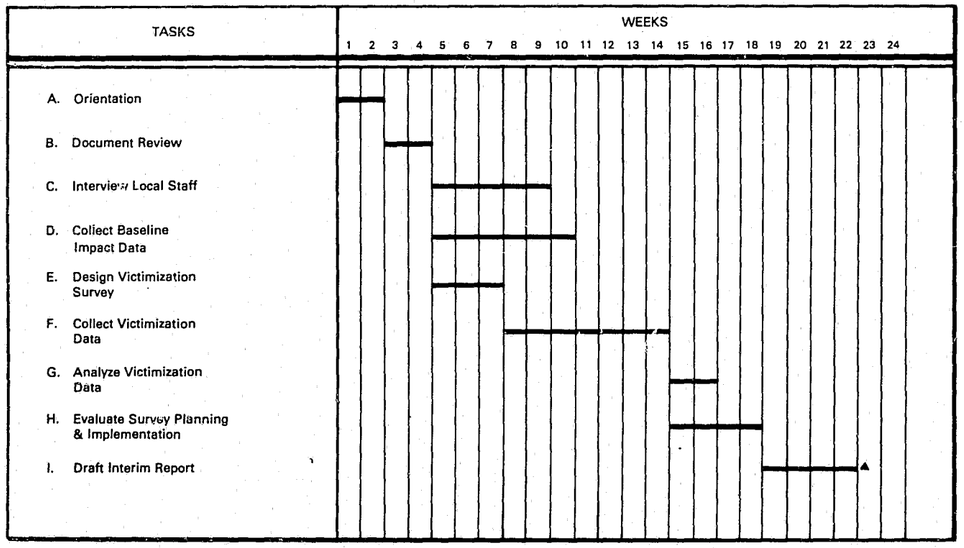


Exhibit 3.

GANTT CHART

State Analysis of Local Crime Reduction Program Impacts - Weekly Schedule



NOTES

b. PERT Chart

1) Another technique which can be particularly useful for large and/or complex analysis projects is PERT (Program Evaluation and Review Technique).

2) The technique was developed in the late 1950's by the Navy for coordinating and controlling complex projects involving a number of geographically dispersed contractors. PERT allows the planner to examine relationships of tasks to each other over time.

3) In turn, this information permits a "critical path" to be charted of the tasks which are expected to take the longest and which are crucial to completion of the task within a given period of time. To illustrate the application of PERT to the tasks presented in Exhibit 1, Exhibit 4 elaborates the first six tasks (from "1. Project Orientation" to "6. Draft Interim Report") into nine activities.

NOTES

Exhibit 4. Nine Activities

A. Project Orientation

B. Review Documentation

C. Interview Local Staff

D. Collect Baseline Impact Data

E. Design Victimization Survey

F. Collect Victimization Data

G. Analyze Victimization Data

H. Evaluate Survey Planning and Implementation

I. Draft Interim Report

4) Exhibit 5, then, refines each of these activities into specific project events.

5) Project orientation consists of events "1 - Start Project" and "2 - Complete Orientation."

Events are indicated by numbered circles.

Arrows between circles indicate activities that link events and the direction these activities take.

Dotted arrows indicate a relationship but no required activity time, e.g., between "2 - Complete Orientation" and "3 - Begin Document Review."

NOTES

Solid arrows indicate both a relationship and a required duration for the activity, e.g., between "3 - Begin Document Review" and "4 - Finish Document Review," requires an estimated two weeks, i.e., activities consume time and resources.

Note the branching at event "4" into three paths which can occur simultaneously.

By adding the times along each possible path, the critical (or longest) path may be determined.

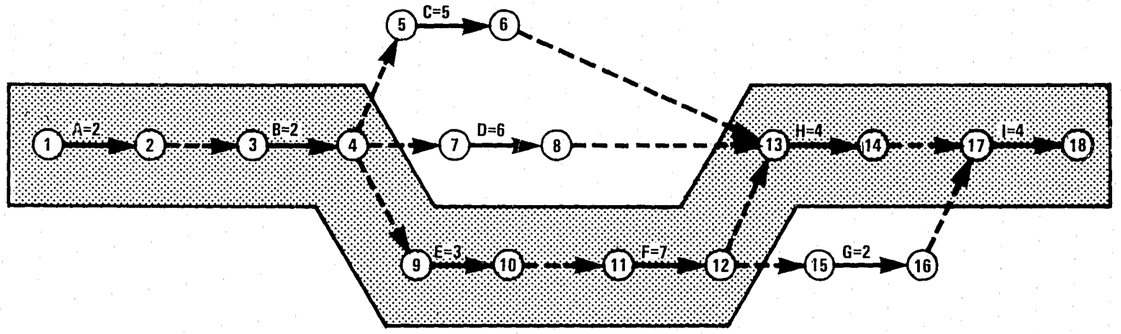
Path 1: A, B, D, H, I = 18 weeks.
Path 2: A, B, C, H, I = 17 weeks.
Path 3: A, B, E, F, H, I = 22 weeks.
Path 4: A, B, E, F, G, I = 20 weeks.

Thus, delays of three and four and two weeks respectively could be tolerated during the implementation of the other three paths without affecting the completion of the Interim Report, whereas any delay along the critical path will in turn delay Interim Report completion.

6) Note how the critical path is boxed in on Exhibit 5.

7) In comparison, a Gantt Chart, while simpler to construct, does not indicate which activities must be completed before others can begin or which sequence of tasks should be given highest priority.

Exhibit 5
PERT Network With Critical Path Indicated For Analysis Project
(Task = Time in Weeks)



EVENTS		
1. START PROJECT	7. COLLECT BASELINE DATA	13. EVALUATE SURVEY
2. COMPLETE ORIENTATION	8. BASELINE DATA COLLECTED	14. COMPLETE EVALUATION
3. BEGIN DOCUMENT REVIEW	9. DESIGN VICTIMIZATION SURVEY	15. ANALYSIS OF VICTIMIZATION DATA
4. FINISH DOCUMENT REVIEW	10. SURVEY DESIGN COMPLETED	16. VICTIMIZATION DATA ANALYZED
5. START STAFF INTERVIEWS	11. COLLECT VICTIMIZATION DATA	17. START INTERIM REPORT
6. FINISH STAFF INTERVIEWS	12. VICTIMIZATION DATA COLLECTED	18. FINISH DRAFT REPORT

Key:
- O Event
- --- Relationship
- → Sequence of events
- A=2 Time between events showing number of weeks

NOTES

8) In an actual application, the PERT network would be specified in more detail than in Exhibit 5. The classic PERT technique also contains procedures for estimating activity times where uncertainty is involved. Estimates are obtained for the "most likely time," "optimistic time," and "pessimistic time," preferably from each individual task or subtask manager; the person directly responsible for the work is responsible for both the estimates and task completion. Variances in the time estimates can be used to calculate the probability of completing the job on schedule.

9) PERT is most useful for large scale and complex tasks such as scheduling and tracking the tasks a large metropolitan or state criminal justice planning agency undertakes over a year period. However, PERT can also be useful on a more informal basis for smaller projects as well.

10) PERT technique is useful for:

    Understanding the relationships and precise nature of the constraints during the development of and implementation of analysis projects.

    During the implementation phase:

    Monitoring progress and slippage during implementation.

    Identifying priorities for resource reallocation through use of the critical path as the highest priority.

    A management tool for reminding individual task managers of their schedules and progress.

11) A summary of tasking techniques is presented in Exhibit 6.

Exhibit 6. Tasking Techniques

1. GANTT CHART

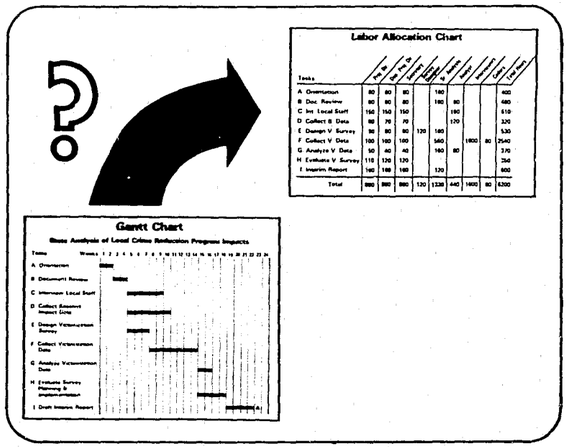
   * WEEKLY TIME LINE FOR EACH TASK
   * SIMPLE TO CONSTRUCT
   * EASY TO UNDERSTAND
   * FAILS TO SHOW INTERRELATIONSHIPS OF TASKS

2. PERT

   * IDENTIFIES PRECEDENCE AND CONCURRENCE RELATIONSHIPS BETWEEN ALL ACTIVITIES AND EVENTS
   * IDENTIFIES CRITICAL ACTIVITIES FOR HIGH PRIORITY ASSIGNMENT OF RESOURCES
   * USEFUL FOR COMPLEX ANALYSIS PLANS
   * CAN BE USED TO ASSESS PROBABILITY OF MEETING DEADLINES

C. Labor Allocation

SHOW V.A. (Mgt.-2):



EMPHASIZE (Mgt.-2):

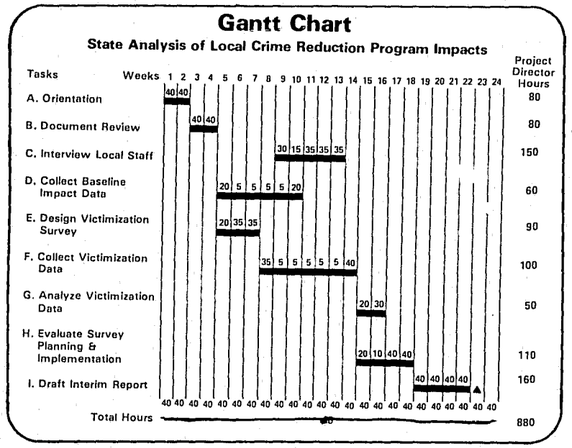
+ This V.A. illustrates how the weekly Gantt Charts may be used to develop the Labor Allocation Chart.

1. Once target dates, based on a preliminary estimate of staff workload and performance, have been outlined on a Gantt Chart, a labor allocation chart can be developed.

2. Knowing how many man-hours to assign to each task requires experience or careful consultation with individuals who have recently completed similar kinds of tasks. A safety margin should be built in since many managers tend to underestimate the actual time needed to complete a task.

3. The Gantt Chart can be used to show personnel requirements for a project.

SHOW V.A. (Mgt.-3):



EMPHASIZE (Mgt.-3):

+ Each weekly column indicates planned allocation of the Director's time for each task.

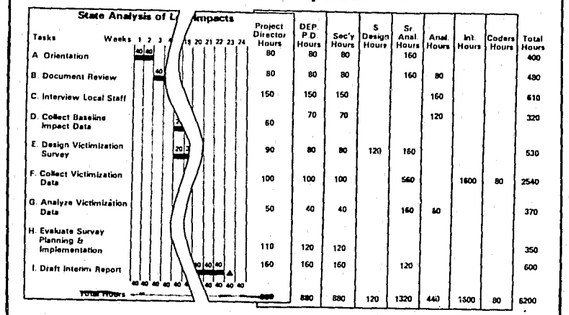
+ The summation column on the right indicates the total amount of time to be spent during the project on each task.

+ Total project time for the Project Director is 880 hours.

4. Consolidating Gantt Charts

SHOW V.A. (Mgt.-4):

Labor Allocation Chart - Obtained by Consolidating the Gantt Charts for Separate Positions



EMPHASIZE (Mgt.-4):

+ The procedure for preparing a Labor Allocation Chart from a Gantt Chart requires preparing a weekly Gantt Chart for each position on all tasks.

+ This V.A. illustrates only the total project schedule and not each position's schedules of activity.

5. Labor Allocation Chart

Based on the consolidated Gantt Charts, a labor allocation chart for the victim survey is presented in Exhibit 7.

Exhibit 7.

Labor Allocation Chart

Tasks	Proj. Dir.	Dep. Proj. Dir.	Secretary	Survey Designer	Sr. Analysts	Analyst	Interviewers	Coders	Total Hours
A. Orientation	80	80	80		160				400
B. Doc. Review	80	80	80		160	80			480
C. Int. Local Staff	150	150	150			160			610
D. Collect B. Data	60	70	70			120			320
E. Design V. Survey	90	80	80	120	160				530
F. Collect V. Data	100	100	100		560		1600	80	2540
G. Analyze V. Data	50	40	40		160	80			370
H. Evaluate V. Survey	110	120	120						350
I. Interim Report	160	160	160		120				600
Total	880	880	880	120	1320	440	1600	80	6200

NOTES

After a preliminary manpower allocation is made, the analyst should check to ensure that the labor allocations are sufficient to permit completion of each activity within the allotted time and that the staff assigned to various tasks actually will have the time available which has been allocated. If either is troublesome, adjustments will have to be made to either the Labor Allocation Chart, the Gantt Chart or both until a satisfactory compromise is reached.

D. Budget

1. Assessing the costs of the proposed analysis project should be fairly straightforward once the previous documents have been completed.

2. A sample budget is provided in Exhibit 8 for activities E, F and G of the Labor Allocation Chart (the victimization survey).

3. Three major budget categories -- salary and wages, including fringe benefits; direct expense items; and indirect costs (e.g. overhead) are included.

4. Labor costs, for example, are based on the labor allocations as presented in Exhibit 7.

Exhibit 8. Sample Budget For Proposed Victimization Survey

SALARIES & WAGES	HOURLY RATE	HOURS	COST
Project Director	12.21	240	2,930
Deputy Proj. Director	10.54	220	2,319
Secretary	5.64	220	1,241
Survey Designer	8.65	120	1,038
Senior Analysts	8.03	880	7,066
Analyst	5.17	80	414
Interviewers	3.50	1600	5,600
Coders	5.00	80	400
Total S & W			21,008
Fringe 30% of S & W			6,302
TOTAL DIRECT LABOR			27,310
EXPENSES			
Computer			1,467
Printing			1,000
Telephone			8,400
Keypunch/Verification/Cleaning			1,250
Total Expense			12,117
TOTAL DIRECT COSTS			39,427
*INDIRECT (70% of S & W)			14,706
TOTAL COSTS			54,133

* Negotiated percentage only applicable for a grant or contract application. Not used in operational budgets.

NOTES

5. In developing a budget the analyst should assess the scope of the tasks (in Exhibit 8, a telephone survey of 5,000 cases to be completed within six weeks), costs of other alternatives (e.g., other consultants or in-house staff work) and what the probable results of various alternatives are likely to be. Such information is essential to the planner when developing and justifying a budget.

6. The steps in preparing a budget are presented in Exhibit 9.

Exhibit 9. Costing: Developing A Budget

(1) ASSESS LEVEL OF EFFORT FOR EACH TASK

- TYPE OF RESOURCES
- MAGNITUDE

(2) ASSESS COSTS OF ALTERNATIVES

(3) BASIS FOR COSTING

- PROFESSIONAL JUDGMENT
- PRIOR STUDIES
- AVAILABLE RESOURCES
- PRE-TEST
- PURE GUESSTIMATES

E. Summary of Work Plan

1. Tasking

   Gantt or Pert Chart

2. Labor Allocation

   Labor Allocation Chart

3. Budget

NOTES

III. BENEFITS OF PLANNED ANALYSIS

From the perspective of the city manager, mayor, or taxpayer, analysis plans help to ensure that a useful product will result from the agency funds expended. Such plans also may permit participation in the setting of analysis priorities by citizens and other important actors within the jurisdiction who may have to use the results or support the work.

SHOW V.A. (Mgt.-5):

BENEFITS OF PLANNED ANALYSES

- PROVIDE DIRECTION AND FOCUS TO WORK EFFORT
- BETTER UTILIZATION OF RESOURCES
- IMPROVE PRODUCT QUALITY
- CLARIFIES RESPONSIBILITIES
- CAN BE USED AS A SELLING TOOL

EMPHASIZE (Mgt.-5):

+ An analysis plan, from a manager's or supervisor's point of view, has the following advantages:

  - Provides direction, helps to organize, and reduces uncertainty and risk.

  - Gives the manager a better ability to judge the relative priorities, uses, and resource requirements of various proposed analysis tasks.

  - Enables staff to be more satisfied since their own analysis projects, when evaluated on the basis of clear analysis plans and conducted according to those plans, can be adequately supported and should result in a superior product.

NOTES

- Reduces uncertainty by assisting the manager in making a realistic assessment of what the office can accomplish given present staff and funding.

- Provides the manager with concrete proposals for analysis which could be carried out with additional funding.

- Early agreement among the key actors on the problem and the product is desirable.

- The review and comments can be made before the analysis is conducted. A written plan, of course, would facilitate such review.

- The scale of the proposed analysis warrants a close scrutiny of resource commitment.

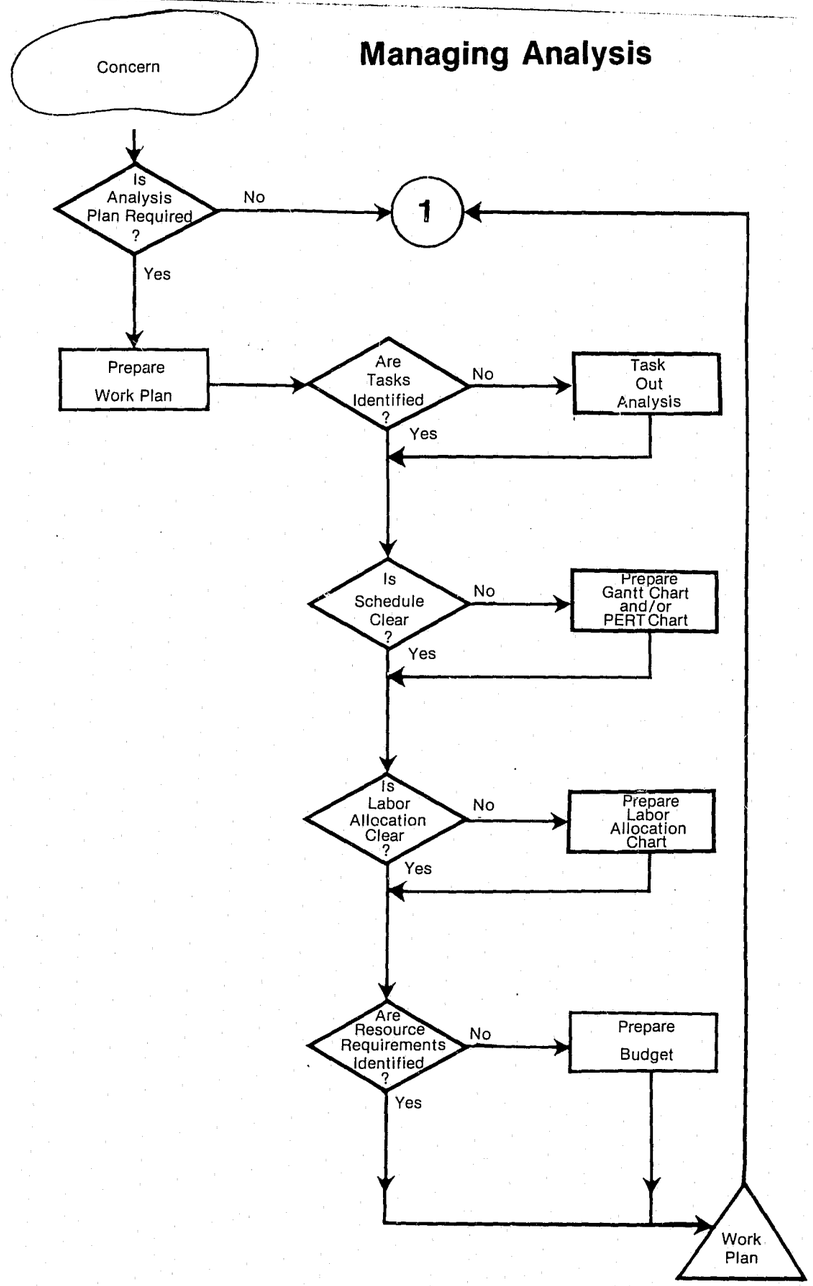
IV. CONCLUSION

Summarize module using the module chart.

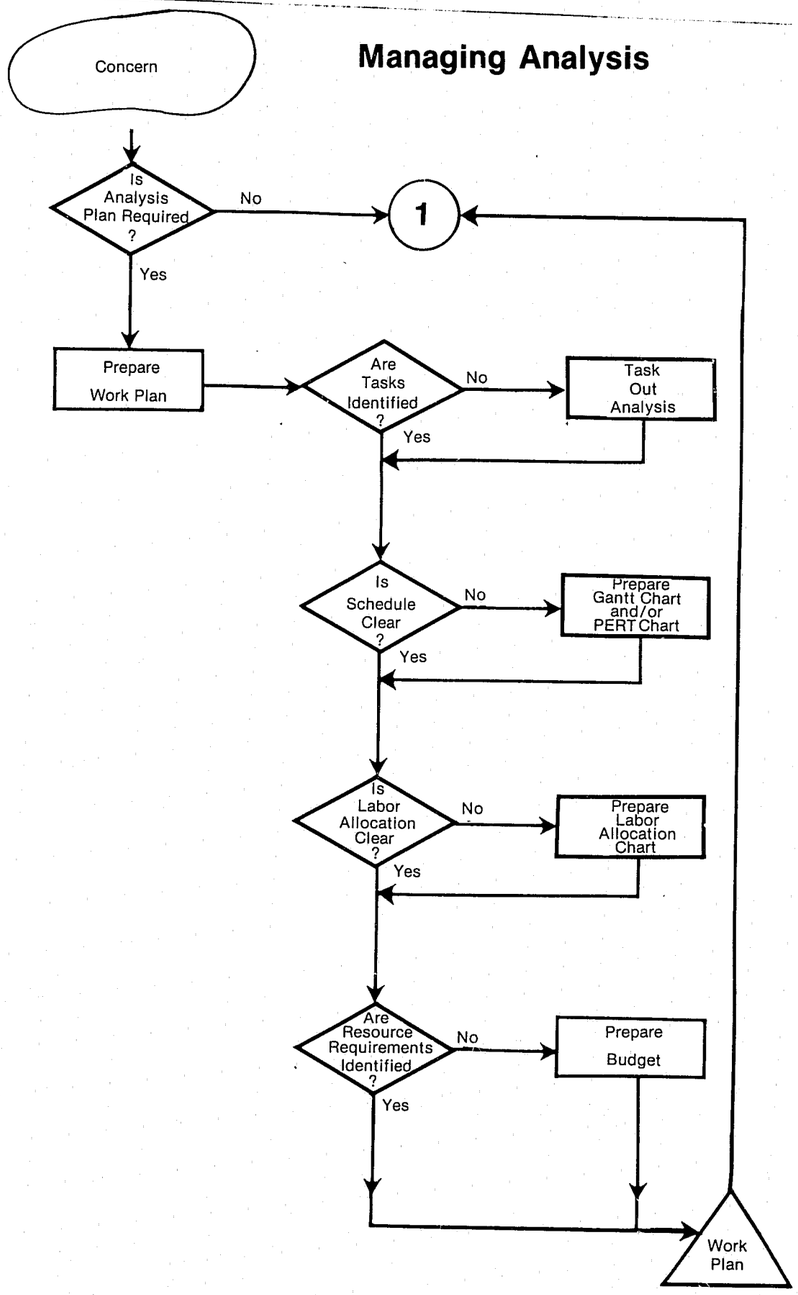
A. Emphasize that analysis projects, such as the simulation in this course, to be effective must be well managed.

B. Emphasize that the principles of this module must be implemented in any large scale analysis activity.

C. Acknowledge that the Criminal Justice Analysis Course is a simulation in which most of the management tasks are already done by virtue of the structure of the week's program.



Managing Analysis



MODULE 1
PROBLEM SPECIFICATION

Module 1 covers a central and, perhaps, the most difficult aspect of the course: problem specification. Criminal justice analyses have suffered from inadequate and incomplete problem statements as reflected in reviews of state and local plans, research reports and other criminal justice publications. It is important that the participants have a full understanding of the nature, ingredients, form and use of problem specification. Their ability to successfully complete the Major Exercise, in part, hinges on their having a clear specification of their problem from the beginning.

Perhaps the most difficult part in developing an understanding of a problem is the creative work of conceptualizing and hypothesizing. No amount of lecturing on such topics can substitute for participation. Therefore, the material has been structured to provide careful definition, illustrations and then an opportunity to practice these skills in Tasks #1 and #2 of the Major Exercise, after completing Module 2.

OBJECTIVES -- MODULE 1
PROBLEM SPECIFICATION

1. To identify the importance and uses of problem specification.

2. To enable participants to perform a problem specification.

SCHEDULE

PROBLEM SPECIFICATION

TIME ALLOCATION

	TOPIC	TIME	PAGE
I.	HOW PROBLEMS ARE SPECIFIED	30 minutes	I-3
A.	Definition	5 minutes	I-3
B.	Concerns	5 minutes	I-3
C.	Concepts	5 minutes	I-5
D.	Variables	5 minutes	I-5
E.	Measures	5 minutes	I-6
F.	Examples	5 minutes	I-7
G.	Hypotheses	5 minutes	I-11
	Walk-Through 'A' TYPICAL STATEMENTS OF CONCERNS ABOUT CRIME AND THE CRIMINAL JUSTICE SYSTEM	20 minutes	I-15
	Walk-Through 'B' WRITTEN PROBLEM STATEMENT: AUTO THEFT IN CHAOS CITY, 1977	30 minutes	I-19
II.	CONCLUSION	5 minutes	I-38
	TOTAL TIME	90 minutes.	

NOTES

I. HOW PROBLEMS ARE SPECIFIED

A. Definition of Problem Specification

Definition: Problem specification consists of 1) the identification of concerns; 2) the elaboration of concepts, variables and measures; and 3) postulating hypotheses.

B. Identification of Concerns

1. Definition: In this course a concern is defined as the vague and/or frequently unspecified hunches and/or attitudes about aspects of crime and the criminal justice system. For example, some concerns within the criminal justice system are equity, fairness, crime prevention and offender rehabilitation.

2. Typically concerns are not well articulated and are usually reactions to symptoms -- not causes.

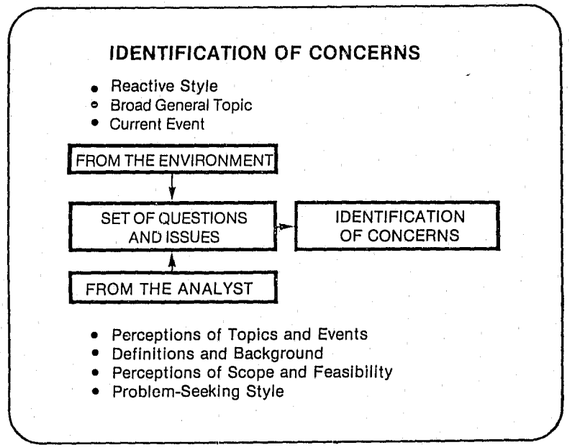
3. Identification of concerns requires both a "reactive" and "problem seeking" style on the part of the analyst.

   a. A reactive style is one in which the analyst responds to the demands and concerns of decision-makers for information.

   b. A problem-seeking style is one in which the analyst generates the questions and identifies concerns requiring the attention of decision-makers.

NOTES

SHOW V.A. (1-1):



EMPHASIZE (1-1):

+ The alternative approaches (styles) an analyst can take to identification of concerns.

+ How concerns are usually expressed as questions or issues.

+ An example of the genesis of a concern could be used to illustrate these points.

NOTES

C. Elaboration of Concepts

1. Definition: In this course a concept is defined as a distinguishable component found or expressed within a concern. For example, offender attitudes, economic status, system operations and recidivism help further the understanding of what is meant by rehabilitation.

2. Concepts vary in terms of their abstractness; e.g., seriousness of crime is more abstract than the incidence of crime.

3. Concepts are, often, not observable (or counted); e.g., one cannot directly see "crime prevention" nor count it without further elaboration of the concept.

4. For analysis purposes, it is generally well to sort out the areas of concern so that the questions and concepts inherent in each area may be determined and specified. Subjecting vague and multiple concerns to analysis generally results in the production of masses of data which have little analytic utility and produce little useful information.

5. Concepts, while generally not observable, are used to focus our efforts, organize our analyses and, most significantly, guide in the selection of variables.

D. Elaboration of Variables

1. Definition: A variable is defined as a characteristic trait, attribute, or event, having more than one possible value.

2. More often than not a concept may be expressed through many variables, e.g., recidivism might be expressed as rearrests, reconvictions, and reincarcerations. The variables contained in reported crime often include the type of crime committed, the characteristics of the victim reporting the crime, the area of the city in which the crime was committed.

NOTES

3. Elaborating concepts into variables forces the analyst to clarify exactly what is meant by the concept being studied, that is, it forces difficult but important choices.

4. In elaborating concepts into variables it may be important to sort out the variables into presumed causes and effects. For example, if urban growth is measured by the variable, population increase, population increase could be identified as a causal variable. The effect or outcome of population increase might be changes in the frequency of armed robbery and burglary.

5. Speculations about cause and effect are complex and inherently risky.

6. Those variables thought of as causal are called independent variables and those which can be identified as effects are called dependent variables. That is, population increase is the independent variable since it is thought to be the precipitating factor of increases in the incidence of armed robbery. Armed robbery is the dependent variable, its occurance is thought to depend upon urban growth.

E. Elaboration of Measures

1. Definition: In this course a measure is defined as an observable qualitative or quantitative indicator used as a standard for description or comparison.

2. Some variables are easy to measure, such as the number of residential burglaries reported to the police; others are quite complex and not easy to measure such as citizen perception about street safety after dark.

3. Measures used in criminal justice range from very simple and easy to understand frequencies to complex index numbers such as population-at-risk measures for specific crimes.

4. In Module 2, the topics of measurement and measurement accuracy are presented.

NOTES

F. Examples of Problem Specification

Exhibit 1 presents three examples of problem specifications covering a portion of each problem found in the Staff Reports of the Major Exercise.

EXHIBIT I: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: CRIME

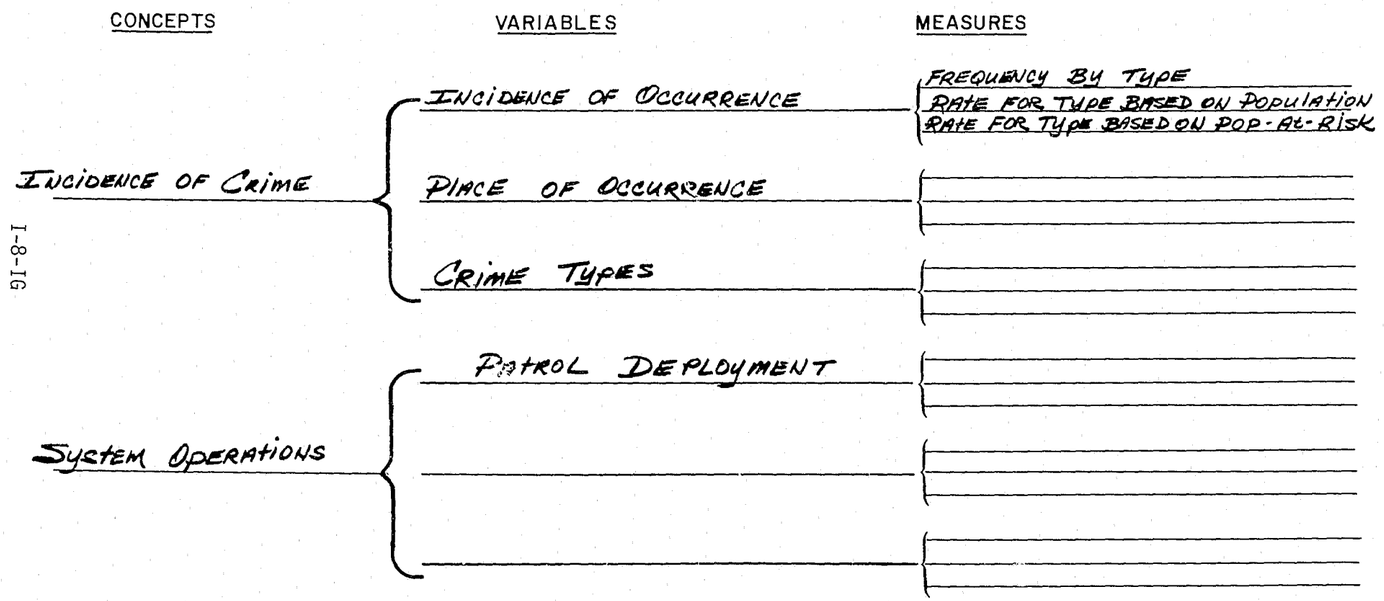


EXHIBIT I: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: C.J. System

CONCEPTS	VARIABLES	MEASURES
OPERATION	WORKLOAD	NUMBER OF CASE FILINGS NUMBER OF CASE FILINGS BY CASE TYPE NUMBER OF CASE HEARINGS
	RESOURCE	
	Output	
ENVIRONMENT		

EXHIBIT I: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: CAREER CRIMINAL

CONCEPTS	VARIABLES	MEASURES
RECIDIVISM	REARRESTS	TIME BETWEEN RELEASE & REARREST RATE OF REARREST TYPE OF OFFENSES
	RECONVICTIONS	
	REINCARCERATIONS	
OPERATIONS	LENGTH OF SENTENCE	

I-10-IG

NOTES

G. Postulating Hypotheses

1. Definition: A hypothesis is a statement asserting a relationship between either concepts, variables, or measures.

2. Formulating hypotheses is an art and not a science. The analyst must draw upon the criminal justice literature and his or her own background and experiences to construct hypotheses.

3. Hypotheses are important because they help to establish boundaries of a problem and may suggest potential problem-solving strategies.

4. Most hypotheses are non-causal, descriptive assertions of relationships, e.g., time and crime, location and crime. In this course, such hypotheses will be called descriptive hypotheses.

5. Some hypotheses imply a cause and effect relationship. In this course, such hypotheses will be called causal hypotheses. Causal hypotheses are inherently complex and risky.

6. Hypotheses are a tool of the analyst; used to organize data and make explicit the nature of the problem being considered. The analyst must determine whether the concepts and related variables covered by the hypothesis can be measured and will be supported by the data.

7. Examples of Hypotheses

   Exhibit 2 presents examples of hypotheses that are constructed for the problems presented in Exhibit 1.

EXHIBIT 2: CONSTRUCTING HYPOTHESES

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
1) System operation is related to the incidence of crime.*	a) Patrol deployment is related to place of occurrence.	1) In 1971 the frequency of auto theft by neighborhood is related to the av. no. of patrol cars assigned to each neighborhood.
		2)
	b)	1)
		2)
2) System operation has changed over time.**	a) Workload of the Prosecutor's Office has changed over time.	1) The number of cases filed was increased between 1971 and 1976.
		2)
	b)	1)
		2)
3) Administration influences offender behavior.*	a) Severity of sentence is related to length of time between release and rearrest.	1) For those persons released in 1975, the number of months served is negatively related to the number of months between release and rearrest.
		2)
	b)	1)
		2)

* CAUSAL HYPOTHESIS ** DESCRIPTIVE HYPOTHESIS

NOTES

8. The interactions and inter-dependencies between concerns.

   Exhibit 3 illustrates that many hypotheses may involve interactions and relations among concerns. In performing the Major Exercise as in the actual conduct of analyses some relationships should be explored between such concerns, difficult as it may be.

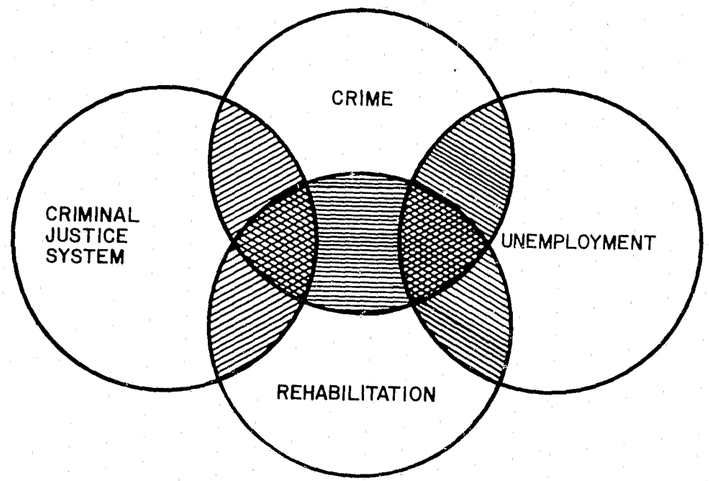
   Problem specification, as just illustrated, tends to focus the analyst's attention on a single concern, yet the interrelationship among concerns may be central to a complete problem analysis.

   For example, a full understanding of crime prevention may require examination of recidivism data to explore possible crime patterns among career criminals.

   Note in Exhibit 3 that the overlap of circles indicates the interaction and interrelation of factors. The circles for the Criminal Justice System and crime overlap. This overlapping suggests that programs in the Criminal Justice System impact crime and likewise criminal activities impact funding and programs of the Criminal Justice System. Rehabilitation of offenders impacts both the Criminal Justice System and crime. Together rehabilitation, crime and the Criminal Justice System may also be interrelated. In considering unemployment, its impact on the Criminal Justice System is shown as an indirect influence through its influence on crime and rehabilitation. Likewise, as with the other factors, crime and rehabilitation interact with unemployment.

EXHIBIT 3

INTERACTION & INTERRELATIONS AMONG CONCERNS



WALK-THROUGH 'A'
Typical Statements of Concerns about
Crime and the Criminal Justice System

PURPOSE

The purpose of this Walk-Through is to illustrate how the problem specification characteristics may be used to critically evaluate statements about concerns. Such concerns are typically presented in brief narratives with incomplete information. Following are three such narratives which are to be analyzed by identifying either explicit or implicit concerns, concepts, variables, measures and hypotheses.

INSTRUCTOR NOTES

A. Maximum time available for this Walk-Through is 20 minutes. Depending upon how the participants grasped problem specification, review one, two or all three of the examples.

B. Instructor is to first, give the group no more than five minutes to review the statement on Crime Trends in Chaos City, Example 1.

C. Secondly, ask the participants to point out the central concern and concept, and next, the variables, measures and hypotheses. After the participants have given their input, go through the example systematically indicating all these items, calling particular attention to those not mentioned by the participants.

D. Finally, discuss how measures are used in construction of Table 1, but the interpretation of the Table involves consideration of the related concept.

E. Follow the same procedure for the statements in Example 2 and Example 3.

1. Example 2 contains a statement of the manner by which a district court disposed of cases of homicide, rape, robbery and aggravated assault. The instructor should note the central concern and concept(s), the specified variables, measures and hypotheses, and allow discussion of other relevant hypotheses, variables and measures which might be considered in analyzing the concern.

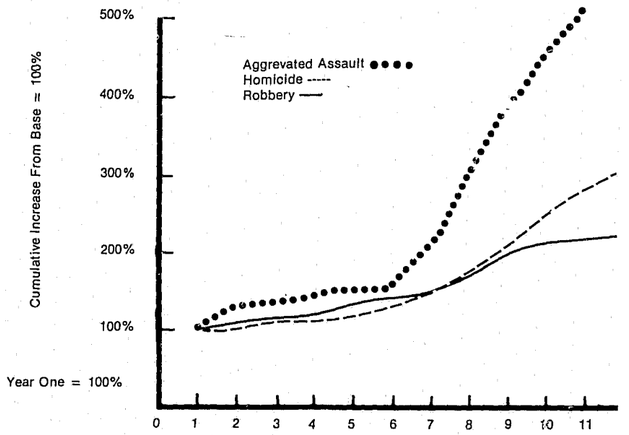
2. Example 3 is a typical statement which contains virtually no statistics but nevertheless is a product of the analysis process. Examples like this often arise as a result of citizen initiatives or public outcry.

DATA SET/WORKSHEET

A. Example 1

	Crime Trends in Chaos City	Concern
	Historically, aggravated assault and homicide rates in this area have been relatively low, and these crimes have not been considered serious problems.	Measures Concept
	By contrast, the rate of robbery has always been quite high; most observers have consistently identified robbery as the jurisdiction's most serious crime problem.	Measure
	Analysis of recent trend data, however, indicates that the city's assault rate has shown dramatic increases over the last several years.	Measure
Concept	These increases substantially out-distance the proportional increase in robberies and indicate that unless preventive action is taken assaults may become a significant problem.	
	This trend is exacerbated by recent signs that the homicide rate is now increasing as a result of the increase in assaults.	Hypothesis
	Fortunately, the assault increase has, according to police statistics, come primarily in assaults which involve knives and blunt instruments. Since these are less often fatal than firearm assaults, the homicide rate has not risen as rapidly as the assault rate.	Hypothesis
Hypothesis	Should firearm assaults resume their traditional proportional role, however, the city is likely to suffer a very substantial increase in homicides.	

Example 1. Table 1. Proportional Increases in Assault, Homicide and Robbery in Chaos City By Year



Source: Chaos City Police Department, Annual Report, 1977

WALK-THROUGH 'A'

B. Example 2

District Court Processing of Felony Cases — Concern

Concept / Measure / Measure / Measures / Hypothesis

A six-month sample of homicide, rape, robbery and aggravated assault offenses during 1974 was analyzed to determine how serious felony cases were disposed of at the District Court level. A total of 342 such offenses were included in the sample. Twelve percent of the cases were still pending, and 10% were deferred prosecution or judgment cases. About half of the remaining cases (43%) of the total were plea bargained to a lesser felony or misdemeanor plea. In addition to this plea bargaining, one-fifth of all cases (one-fourth when pending and deferred cases are excluded) were dismissed. The proportion of those convicted on the original charge varies from case to case. None of the 27 homicides, 4% of the assaults, and 5% of the burglaries resulted in a conviction on the original charge. On the other hand, 28% of the rape cases and 15% of robberies had a conviction for the original most serious charge. The analysis leading to the problem statement indicates a significant degree of unevenness in the way these four types of cases were handled at the district court level. This suggests a lack of quality control over cases tried in district court.

Measures

WALK-THROUGH 'A'

C. Example 3

Rape in Chaos City — Concern

Variable / Variable / Measure / Variable

Social agencies have always given too little attention--and too little understanding--to the victims of rape. The results have been both that many, perhaps most, rapes are never reported to law enforcement agencies and that victims, scared by the callousness of the system, are unwilling to testify in court, thereby minimizing the possibilities of conviction for the offender. Chaos City recently witnessed a series of grotesque and highly publicized rapes. Although the overall rate of reported rapes does not seem high for the city, these specific incidents have galvanized citizen interest and have led to the formation of a citizen law enforcement task force; already this group has raised sufficient funds within the community to give it some stability and to allow it to formulate a series of pilot proposals. Thus, the city presents an excellent environment for testing innovative concepts about improving the treatment of rape victims and increasing the conviction rate in the prosecution of rape offenders.

Variable

DEBRIEFING NOTES

A. Provide transition from Walk-Through A to Walk-Through B
   1. Establish the difference between a concern and a problem
      a. Concerns frequently are:
         (1) Hunches based on limited observation.
         (2) Conclusions drawn from incomplete, unrepresentative and/or unreliable data.
         (3) As indicated earlier, reactions to symptoms.
      b. Problems are:
         (1) Conditions that deviate from a norm or standard that is acceptable in a given community.
         (2) A conclusion that is based on representative and reliable information.
         (3) Generally caused by factors that are not readily apparent.
      c. Because most problems are inherently complex, fairly rigorous and interative analysis is necessary to adequately describe, draw emphasis about and understand the primary causes of a problem.
      d. Because problem analysis may be intricate logically, often uses data, and involves statistical computations, it is important that the problem statement focus consisely on the problem.

      A clearly written and understandable problem statement is necessary if it is to be used by decision-makers.
   2. Define a problem statement:

   3. Explain that Walk-Through B provides an example of a written problem statement.

WALK-THROUGH 'A'

WALK-THROUGH 'B'
Written Problem Statement

PURPOSE

The purpose of this Walk-Through is to reinforce the process of Problem Specification and to provide a concrete example of a Written Problem Statement. This statement serves as an illustration of one of the two products required by the Major Exercise. The Walk-Through uses the same forms as in the Major Exercise focusing on concepts, variables, measures and hypotheses. Specifically participants are required to identify each of these in the provided statement.

INSTRUCTOR NOTES

A. Have the participants review the first page of the Problem Statement identifying on that page the concepts, variables, measures and hypotheses being used.

B. Record the groups observations on a blackboard or Flip Chart. Be sure to use the same form as is used in the Major Exercise in order to provide participants a clear understanding of the process and product expected of them in the Major Exercise.

C. Proceed to the next page and record the groups observations. Continue with this process until you have completed the Problem Statement.

D. Distribute the prepared Problem Specification and compare the groups work to the paper solution.

E. Indicate that Problem Specification is 1) usually an implicit part of good analyses; 2) a useful process for understanding what a report means; 3) is as much creative as it is mechanical.

F. The value of a well specified problem and a good problem statement is that alternative intervention strategies are almost by-products of the process that produces the statement.

DEBRIEFING

A. After completing the last problem statement, summarize the lessons of the Walk-Through, with special emphasis on the items which the participants seemed to miss in their discussion. First, point out how problem specification is used in formulating a problem statement. Second, discuss the necessity of having the following:

1. Good Conceptual Foundation. That is, a decision-maker's concerns about whether a treatment program works are directly related to the use of recidivism as a conceptual foundation for the problem statement.

2. Use of Valid and Reliable Measures

3. Careful Interpretation of Data

4. Skillful Presentation of Information

B. Finally, note that this Walk-Through served two purposes:

1. To show the participants how to apply problem specification

2. To provide a basis for understanding why problem specification is important. In this context, problem specification provides a structure and process for screening concerns and identifying the existing gaps in our understanding of those concerns.

3. The Walk-Through is essentially identical to the first task of the Major Exercise in which participants will critically read staff reports and apply this process to elaborate a set of hypotheses.

Exhibit 1. Problem Statement: Auto Theft in Chaos City, 1977.

1. Introduction To Problem

According to State of Paradise Statute 609.55 (1971), auto theft involves the unauthorized use of a motor vehicle without the consent of the owner or an authorized agent of the owner. This analysis focuses upon thefts and unauthorized use of all motor vehicles. Where appropriate, distinctions are made between theft of automobiles, trucks, motorcycles and other motorized vehicles. Since the bulk of the auto theft problem is associated with private automobiles, the greater portion of this problem statement is concerned with analysis of automobile thefts.

Data was collected from Chaos City police offense reports for the period under study--July 1, 1974 through June 30, 1975. A random sample of 20 percent, or 1 in 5, offense reports was selected for analysis. The analysis of sampled offense reports is the basis of this analysis. Where appropriate, numbers listed in the text, figures, and tables have been multiplied by five to correct for the sampling procedure. References to Chaos police offense report data refer to the sample data.

During the period under study, there were 5,085 thefts of motorized vehicles recorded by the Chaos Police Department. These were distributed as follows: automobiles-4,450, trucks-255, motorcycles-335, and other motorized vehicles-45. Victimization surveys indicate that about 93 percent of all auto thefts are reported to police. Correcting for nonreported thefts would bring the total number of auto thefts for the study period to about 5,470.[1]

Chaos City police offense reports indicate that the overall clearance rate for all motor vehicle thefts was about 7 percent. For automobiles, clearance rates were 10 percent, trucks-11 percent and motorcycles-5 percent. These clearance rates are lower than the 20 percent clearance rate usually reported for both Paradise and the United States.[2] It is clear that most auto thieves in Chaos City have a lower than average likelihood of being caught after the commission of their offense. This low likelihood opens up the possibility of focusing on the prevention of auto theft.

[1]Criminal Victimizations in 13 American Cities, U.S. Department of Justice, LEAA (June 1975), p.124.

[2]Paradise Crime Information, 1973, Bureau of Crime Analysis (BCA) (June 1, 1974), p.49 and Crime in the U.S., Uniform Crime Reports, U.S. Department of Justice (Washington, D.C.: 1975), p.35.

2. Analysis Methods

2.1 Cost of Auto Theft

Although clearance rates for Chaos City are relatively low, the net dollar loss from auto theft may be lower than for other metropolitan areas. Chaos City Police Department estimates for 1975 indicated that the total value of stolen motor vehicles was $5,828,890. However, the total value of recovered motor vehicles was $4,653,803, indicating a net dollar loss of $1,175,087 for 1975.[3] The difference between these figures reflects the fact that most vehicles (90.8 percent) taken from Chaos City are recovered--only 8.5 percent of all thefts are not recovered. The balance of reported thefts are classified as unfounded (for example, the car was not stolen, merely misplaced). Recovery figures for Chaos City are substantially higher than figures for nationwide recovery. National figures indicate that from 70 to 80 percent of all cars are recovered.[4]

Every auto theft incurs costs other than those associated with the value of the vehicle. Automobiles are the nation's primary means of transportation. Loss of an individual's means of transportation, if only for a few days, can impose a burden on the victim of auto theft. Other costs include the cost of prosecution of offenders, increased insurance premiums as a result of auto thefts and the intangible cost of increased concern about crime.

2.2 Measuring Auto Theft

There are at least three methods by which a crime can be measured: 1) frequency, 2) rate per 100,000 persons, and 3) rate per 1,000 opportunities. The third measure--rate per 1,000 opportunities--gives a more complete understanding of the degree to which any given crime represents a problem in a given geographic area.

For Chaos City, the victimization rate for registered automobiles was about 30.9 per 1,000 (1 in 32) for the study period.

[3]Unpublished data collected for Uniform Crime Reports, Chaos City Police Department.

[4]"Preliminary Study of the Effectiveness of Auto Anti-Theft Devices," NILECJ, LEAA (October 1975), p.3.

WALK-THROUGH 'B'

2.3 Where Auto Theft Occurs

Not all areas of Chaos City have the same rate of auto theft. Table 1 displays the different rates of victimization across the city's ten planning communities. Table 1 also demonstrates that the measure of crime used for analysis gives various perspectives on the crime problem in given communities.

In Table 1, the highest victimization rates, independent of the type of measurement employed, are found in the Central and Powderhorn communities.

As shown in Figure 1, 43 percent of all automobiles are taken from parking lots or ramps while only one-third are taken from near the owner's residence or nearby residential streets. Less than 1 in 10 vehicles are taken from the owner's garage or driveway.

A detailed analysis of ramps and lots suggests that the Central, Powderhorn and University communities are most subject to auto theft at these types of sites. (See Figure 2.)

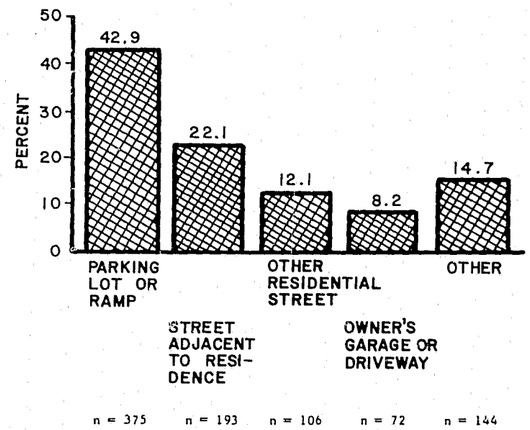
Table 1. Auto Theft Rates by Community, Chaos City, 1977.

	OPPORTUNITY [a]		POPULATION		FREQUENCY [b]	
COMMUNITY	Rate per 1,000 Registered Passenger Vehicles	Rank	Rate Per 1,000 Persons	Rank	Rate	Rank
Central	173.9 (1 in 5)	1	43.5	1	1,135	2
Powderhorn	45.6 (1 in 21)	2	16.1	2	1,295	1
University	40.7 (1 in 24)	3	12.5	3	355	5.5
Near North	37.6 (1 in 26)	4	11.0	4	540	3
Citywide	30.9 (1 in 32)	-	11.7	-	5,085	-
Northeast	26.9 (1 in 37)	5	10.1	5.5	455	4
Longfellow	24.9 (1 in 40)	6	9.7	7	325	7
Calhoun-Isles	23.6 (1 in 42)	7	10.1	5.5	355	5.5
Camden	16.5 (1 in 60)	8	6.4	8	220	7
Nokomis	7.3 (1 in 136)	9	2.9	9	145	9
Southwest	5.9 (1 in 169)	10	2.6	10	145	9

[a]Each registered passenger vehicle is counted as an opportunity. Each community has a sufficiently large number of vehicles to make meaningful comparisons: Calhoun-Isles, 14,995; Camden, 13,338; Central, 6,525; Longfellow, 13,080; Near North, 14,334; Nokomis, 19,907; Northeast, 16,853; Powderhorn, 28,411; Southwest, 24,464; and University, 8,715. Estimates are derived from the Bureau of the Census (1970) figures reporting number of families in tracts owning 1, 2, and 3 or more vehicles. Weighting on the 3 or more category was done by multiplying by 3.1 in order to approximate the total number of vehicles in each tract. Census data are used because they are the only available geographically-based data. Total citywide auto count = 160,622.

[b]Reflects scaling by a factor of 5 to correct for 20 percent sampling.

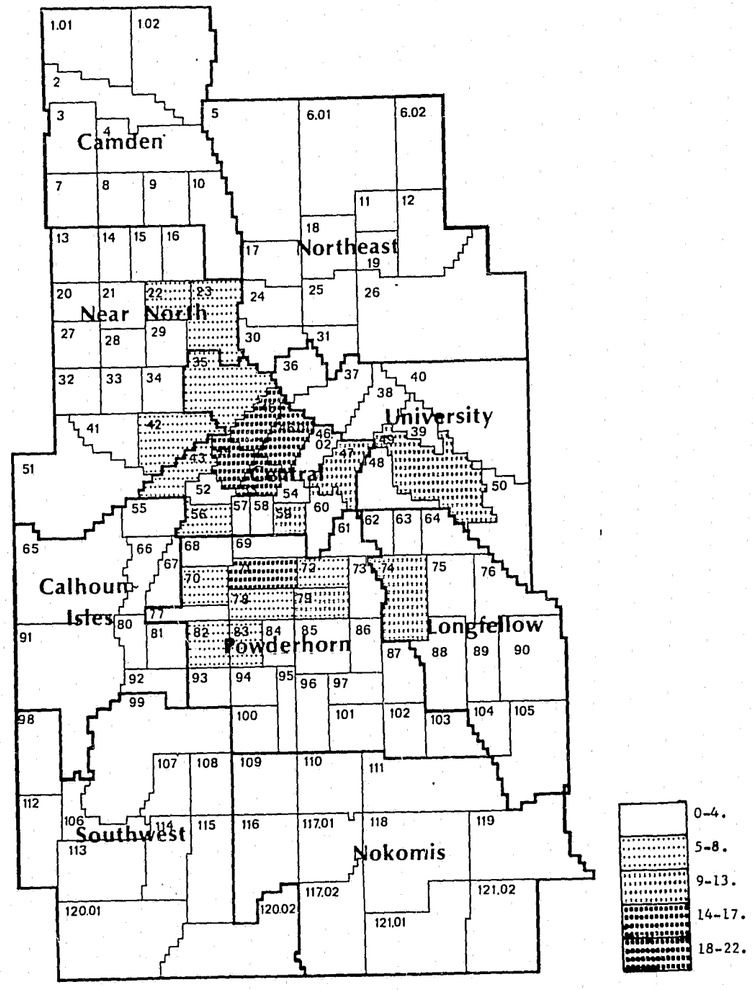
Figure 1. Percentage of Auto Theft by Type of Premise (passenger cars only)



Source: Chaos City Police Offense Report Data, (N=890), 1977

WALK-THROUGH 'B'

Figure 2. Frequency of Auto Theft from Parking Ramps and Lots by Census Tract.



Source: Chaos City Police Offense Report Data, 1977.

2.4 How Vehicles Are Stolen

Recent advertising campaigns have suggested that many vehicles are stolen because the keys are left in the ignition. However, data indicate that most victims report that the keys were not left in the car. As shown in Figure 3, apparently only about 1 in 10 stolen vehicles had the keys left in the car. Only 1 in 20 victims reported the keys as having been left in the ignition. These figures, of course, may conceal deliberate misreporting by the victims. The misreporting may be caused by fear of perceived insurance repercussions or by feelings of incompetence.

These same advertising campaigns have suggested that locking one's car is sufficient deterrence for auto theft. However, data indicate that 57 percent of all victims reported that the car was locked when stolen.

Clearly, the simple precaution of removing the keys from the car and locking the car, though increasing the difficulty of theft, is not by itself adequate to deter auto theft.

Effective January 1, 1970, the U.S. Department of Transportation instituted Motor Vehicle Safety Standard 114 in an attempt to "reduce the incidence of accidents resulting from unauthorized auto use."[5] This standard established two basic requirements for all cars assembled after January 1, 1970:

1) a key locking system which prevented normal engine activation and either steering or self-mobility in the absence of the proper key; and
2) a warning sound when the key was left in the locking system or when the driver's door was open.

As a result of this standard, all cars manufactured after January 1, 1970, had a steering lock which could only be unlocked with the proper key and a buzzer system that made an audible alarm whenever the key was left in the ignition. Table 2 presents evidence that ignition lock systems manufactured in accordance with Standard 114 are an effective deterrent to auto theft.

For the basis of analysis there are three time periods for comparing the relative effectiveness of ignition interlock systems. The first period, pre-1968, is that period when no vehicles were equipped according to Standard 114. The second period, 1969 through 1971, is that period when some but not all vehicles were equipped according to Standard 114. The third period,

[5]"Preliminary Study of the Effectiveness of Auto Anti-Theft Devices," NILECJ, (Washington, D.C.: October 1975), p, 1.

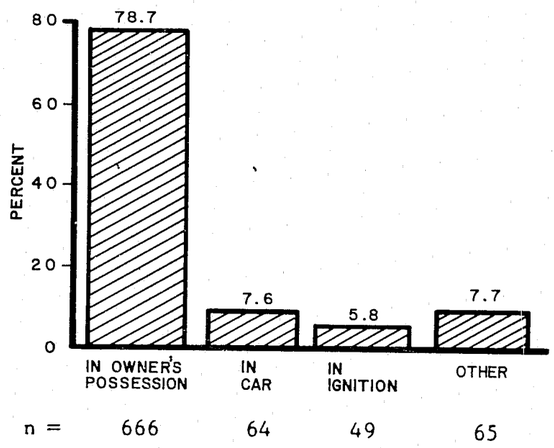
WALK-THROUGH 'B'

CONTINUED

1 of 5

post-1971, is that period when all vehicles were equipped according to Standard 114. Table 2 compares theft rates for various makes of cars for the first and last periods. It also compares thefts of vehicles manufactured before any ignition interlock systems were installed with that period when all vehicles were equipped with ignition interlock systems. As can be seen in Table 2, 55 percent of all vehicles on the road in 1975 (excluding vehicles manufactured during the second period, 1969-1971) were manufactured before implementation of Standard 114 while 45 percent of all vehicles were manufactured after implementation (excluding the second period). However, 88 percent of all stolen vehicles were manufactured before implementation of Standard 114. The figures in Table 2 and 3 present compelling evidence that car thieves preferred to steal cars which were not equipped with anti-auto theft devices.

Figure 3. Percentage of Auto Theft by Location of Keys (passenger cars only)



Source: Chaos City Police Offense Report Data. (N=844), 1977.

Table 2. Percentage of Auto Theft as an Indicator of Ignition Interlock Effectiveness

	Number of Cars	Number of Stolen Cars
Period One[1]	157,519[3] (55%)[4]	649 (88%)
Period Two[2]	118,188 (45%)	86 (12%)

[1]Period One: Cars manufactured prior to implementation of Standard 114.

[2]Period Two: Cars manufactured after implementation of Standard 114.

[3]Figures supplied by Department of Motor Vehicles for Chaos City. These figures included a count for some suburbs resulting in figures larger than those listed in U.S. Census data. The relative proportions are assumed to be correct.

[4]Percentages are computed by excluding cars manufactured during the period 1969 through 1971. About 171,000 vehicles were excluded from this table because they were manufactured during this period.

Source: Chaos City Police Department and Department of Motor Vehicle Registration, 1977.

WALK-THROUGH 'B'

Table 3. Comparison of Expected and Observed Auto Thefts, Two Time Periods

	Expected Number Auto Thefts*	Observed Number Auto Thefts
Period 1	404	649
Period 2	330	86

*Expected number of auto thefts is equal to total number of auto thefts (735) multiplied by the proportion of vehicles manufactured in the period that were on the road (.55 and .45 for the two periods in question)

$X^2 = 327.47$, 1 d.f., significant at $p = .001$.

Source: See Table 2.

2.5 Trucks and Motorcycles

Generally, the characteristics of theft of trucks and motorcycles are identical to the characteristics discussed previous to this point. However, there are some differences. Trucks tend to be taken from parking lots and ramps more frequently (59 percent) than are automobiles (43 percent). Additionally, there are relatively few that are stolen near residences. This is to be expected since many trucks are owned by companies and are parked in company lots.

Motorcycles, however, show a different pattern. Only about one-third (30 percent) of all motorcycle thefts are from ramps or lots. More than one-third are taken from premises at or near the victim's residence. The balance are taken from other sites. Unlike the high recovery rates for trucks and autos, only about one-third (35 percent) of all motorcycles are recovered.

2.6 Suspects

Suspect information for auto thefts derived from offense reports is very sparse. There was some suspect information in only 58 (12 percent) of the studied cases. This data indicated that most suspects (62 percent) were juveniles. Chaos Police Department arrest information indicates that from 88 to 97 percent of all auto theft arrests are of juveniles.[1] Between 95 and 98 percent of all arrests are of persons less than 21 years old. Unfortunately, additional reliable information is lacking from police offense reports.

2.7 Summary

From July 1, 1976, through June 30, 1977, there were about 5,085 thefts of motorized vehicles recorded by the Chaos City Police Department. These consisted of about 4,450 automobiles, 255 trucks, 335 motorcycles and 45 other motorized vehicles. Victimization surveys indicated that approximately 93 percent of all auto thefts are reported to police. Also, the risk of being a victim of auto theft differs by area of the city. The central community clearly has the greatest auto theft problem with a 1 in 5 risk (based on number of registered vehicles).

Ninety percent of all automobiles were recovered while only about 35 percent of all motorcycles were recovered. The recovery rate of vehicles in Chaos City tends to be substantially higher than the national average. Generally, theft of vehicles does not result in resale of the vehicle

[1]Chaos City Police Department, 1977.

WALK-THROUGH 'B'

or stripping for parts suggesting that most thefts are not thefts for personal gain.

Auto theft, although potentially one of the most expensive property crimes in Chaos City, appears to be relatively inexpensive. The total net property loss from auto theft for the one-year study period was about $1,175,000.

Large numbers of auto thefts are of vehicles parked at ramps or lots (40 percent of all auto thefts). Most of these thefts from ramps and lots occur in a very few localized parts of the Central, University and Powderhorn communities. Strategies directed at ramps and lots in selected areas could greatly reduce the victimization rates for auto theft.

Locking vehicles and removing keys from the car may tend to reduce the risk of auto theft. However, large numbers of vehicles are taken which apparently had no keys in them and which were locked. Improved types of auto theft deterrent locks, manufactured according to Standard 114, appear to be a deterrent to auto theft. While vehicles equipped with these locking systems are taken, they are stolen at a much lower rate. This suggests that an improvement of the standards might be an effective deterrent to auto theft.

Little information is available about suspects. However, most known suspects are juveniles.

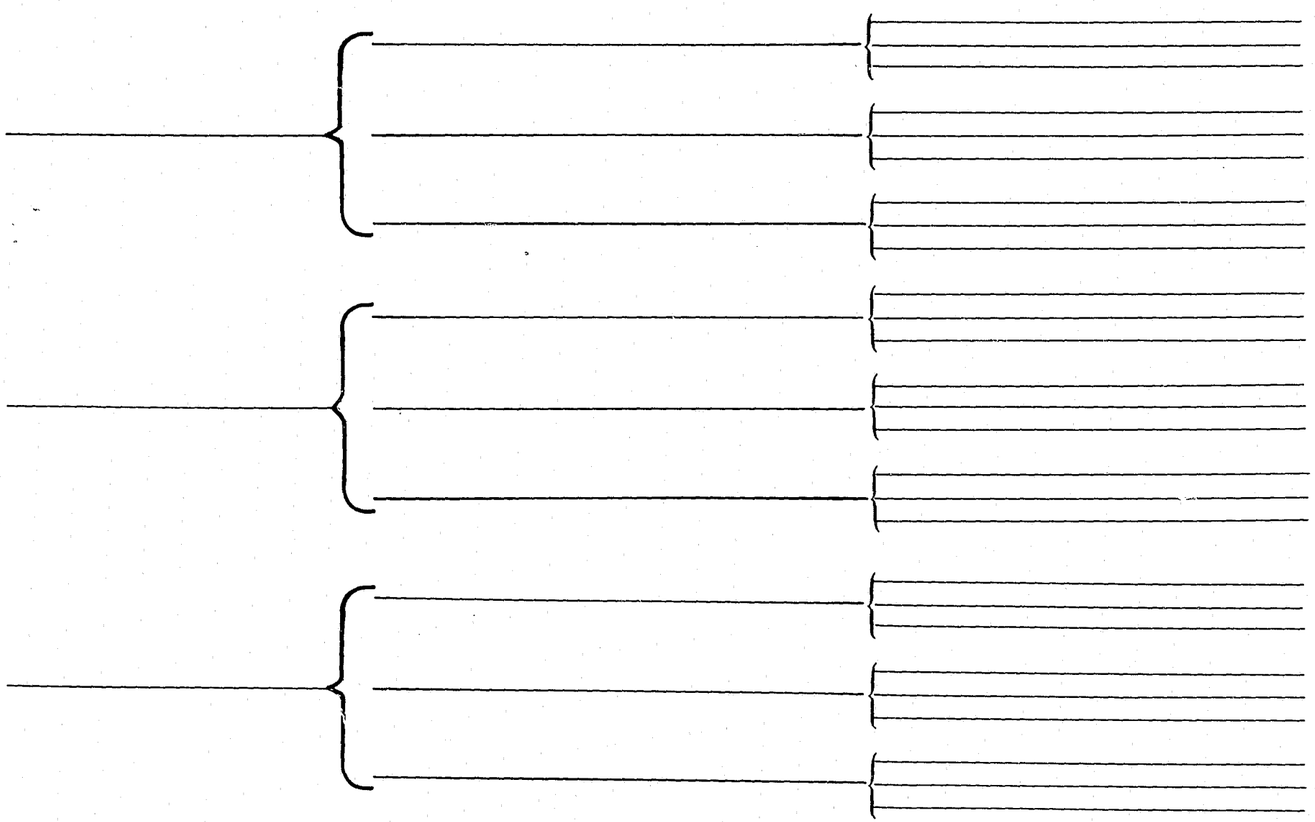
Source:

Adapted from Douglas W. Frisbee, et. al. Crime in Minneapolis: Proposals for Prevention, May 1977. Minnesota Crime Prevention Center, 2344 Nicolett Avenue, Minneapolis, Minnesota 55404, pp. 191-202.

WALK-THROUGH 'B'

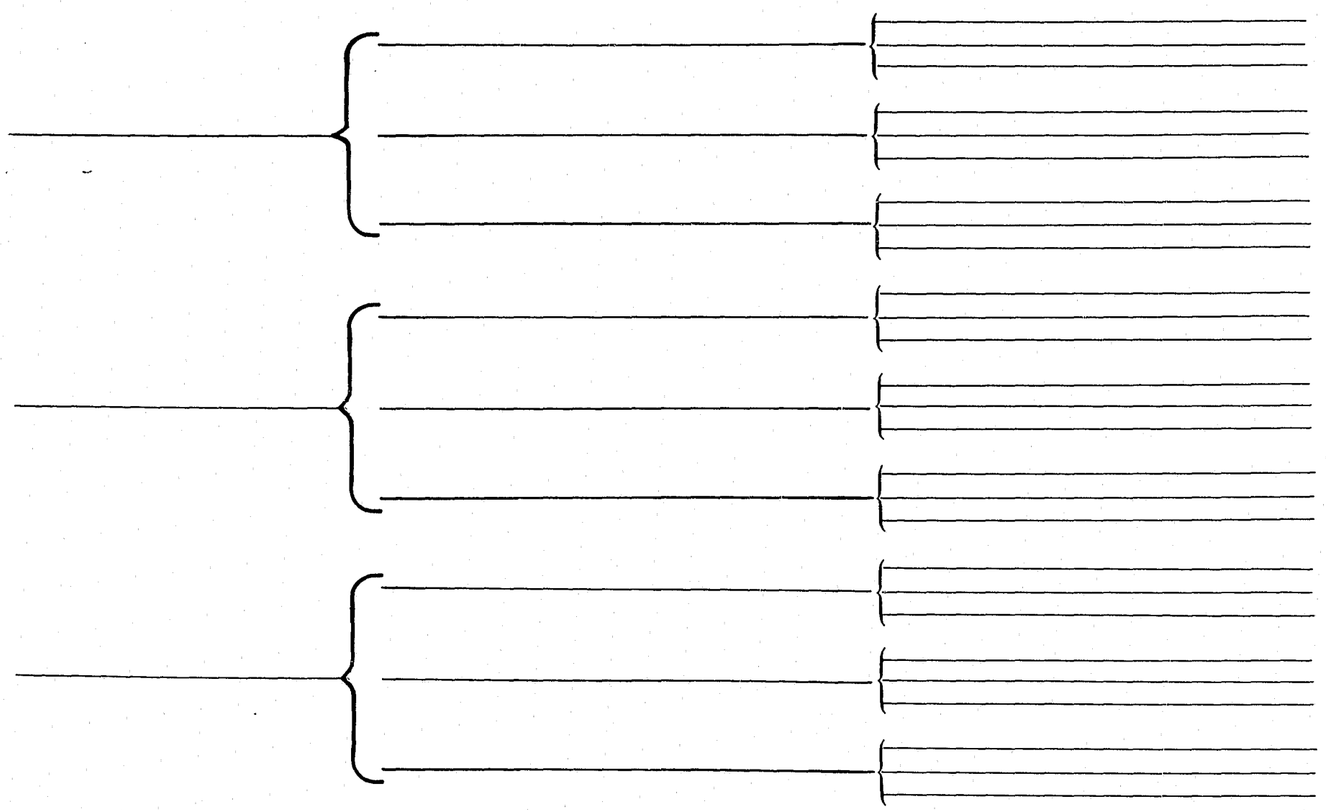
WORKSHEET

Auto Theft in Chaos City Problem Specification



WORKSHEET

Auto Theft in Chaos City Problem Specification
(Concluded)



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WALK-THROUGH 'B'

WORKSHEET

Auto Theft in Chaos City Problem Specification
(Continued)--Postulating Hypotheses

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
1)	a)	1)
		2)
	b)	1)
		2)
2)	a)	1)
		2)
	b)	1)
		2)

NOTES

II. CONCLUSION

A. Weaknesses of Problem Statements resulting from inadequate problem specification.

1. Incorrect and/or unstated assumptions

2. Do not accurately represent actual concern

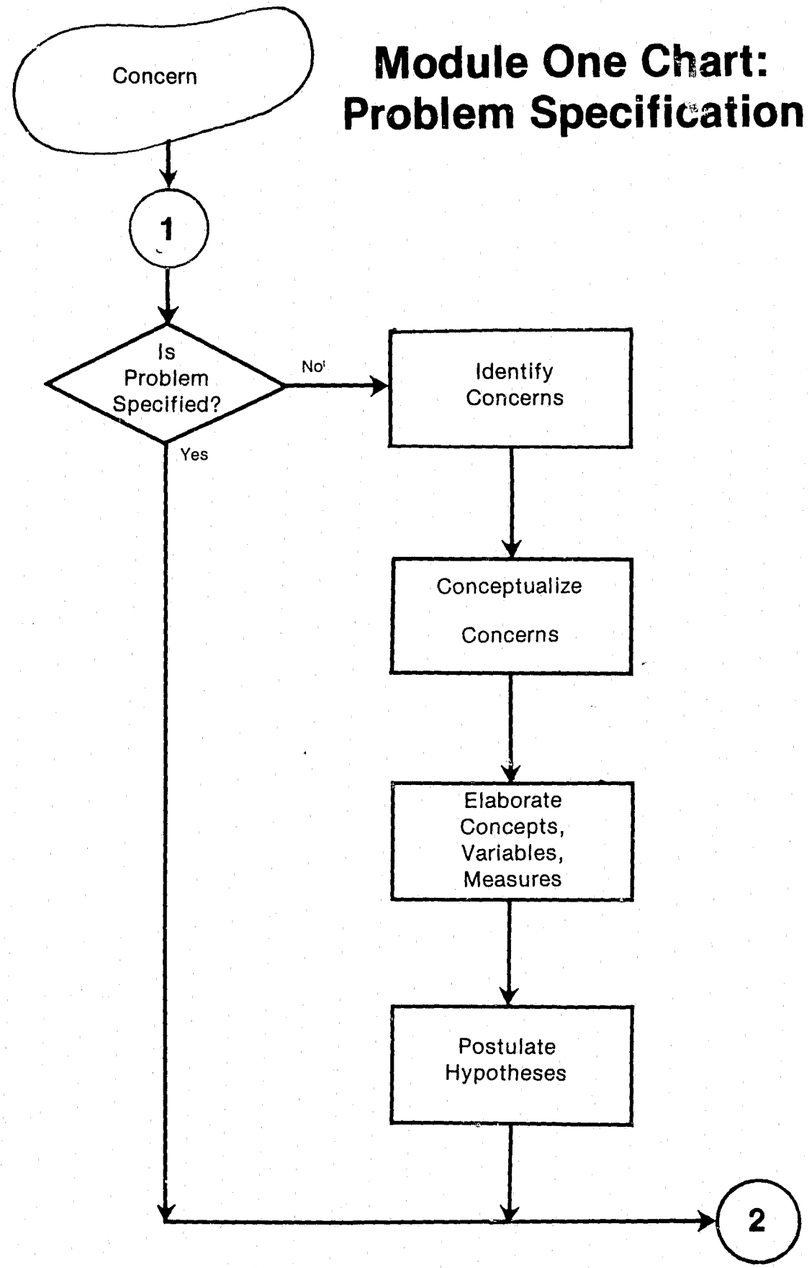
3. Frequently based on illogical relationships

4. Do not use important conceptual relationships to drive analysis

5. Do not make good use of existing or easily obtained data

B. Go over the module flowchart. Emphasize the critical evaluation and elaboration of concerns using the process of problem specification.

SHOW V.A. (1-2):



MODULE 2
DATA SYNTHESIS

Module 2 establishes a foundation for measuring and obtaining data for specified variables. The module is divided into four distinct sections: (1) measurement, (2) planning a data collection effort, (3) sources of data, and (4) assessing hypotheses.

The data collection portion of the module consists of Walk-Through 'B' - Preparing a Data Collection Plan. The final portion of the module dealing with the evaluation of postulated hypotheses provides an opportunity for summarizing much of the material contained in Modules 1 and 2. Since Task #2 of the Major Exercise is also an evaluation of hypotheses, this last section of the module has added importance. The section serves both to summarize and integrate the first day's efforts, and leads into an important task of the Major Exercise.

OBJECTIVES - MODULE 2
DATA SYNTHESIS

1. Describe Types and Extent of Measurement Error
2. Systematically Plan a Data Collection Effort
3. Distinguish Between Secondary and Primary Data
4. Identify and Describe Seven Methods of Data Collection
5. Understand the Six Types of Secondary Data Used in Criminal Justice Analysis
6. Assess Hypotheses

SCHEDULE - MODULE 2
DATA SYNTHESIS

TIME ALLOCATION

* Less than 5 minutes

I. MEASUREMENT

A. Definition:

Measurement is the process of assigning observable qualitative or quantitative indicators to objects or events according to rules.

1. The assignment rules must specify exactly how to measure, when to, what to, who to, etc. It is the quality of the rules that makes the difference between "good" and "poor" measurement. For example, typically with crime data the rules of measurement are legal definitions based on behavior.

2. What are some of the criteria for good rules for measurement?

   a. Present tense: record what is happening now (rather than in the past).

   b. Positive occurrence: record what does occur (rather than what does not).

   c. Singular number: record each event or occurrence (i.e., do not ask your data collector to count or sum up things).

   d. Exhaustive assignment: This means that the rule must provide for some number or label to be assigned to every observation. Often use of an "other" category will accomplish this. The "other" category should not be a catchall.

   e. Mutually exclusive assignment: that is, no observation should be assigned more than one value when measured.

3. There is, and will continue to be, a varying debate over what can and cannot be measured. There are at least two extreme schools of thought on the matter.

   a. One takes the point of view that if you cannot measure something, you're not at all sure what it is that you want to measure.

   b. The other takes the point of view that if you think you can measure something -- then that's not it.

B. Measurement Accuracy

1. The criteria used to determine the accuracy of a measure are its validity and reliability.

2. Definition: "Validity is the degree to which measures are true or accurate indicators of the variables they are thought to indicate."

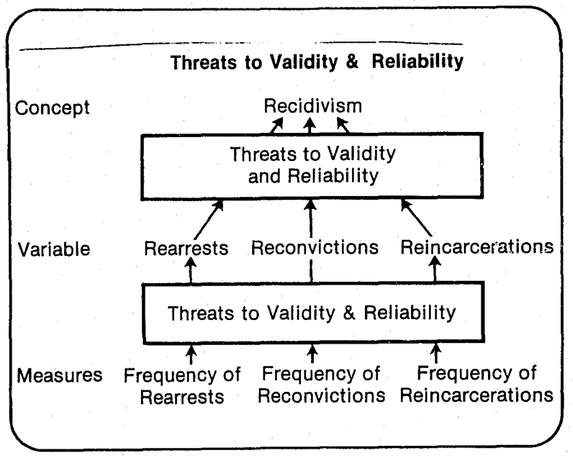
   For example, in self-reported delinquency data, validity tests have included asking kids to indicate awareness of unlawful behavior of other youths, laboratory testing of cheating, and asking teachers to report on a child's behavior, and cross-checking available arrest records.

3. Definition: "Reliability is the degree to which measures are dependable or consistent indicators of a variable from one time to another or from one sample to another." Reliability is easier to determine than validity. It is possible to have very reliable measures which are not valid. Poor reliability threatens (or casts doubt on) validity but good reliability does not assure validity.

   For example, in self-report crime data, a typical test of reliability is to test and then retest the individual. Similiar responses which are alike after two weeks suggest a high reliability of the measure.

C. Factors Influencing Measurement Accuracy

SHOW V.A. (2-1):



EMPHASIZE (2-1)

+ Three types of threats: conceptual, technical and management

1. Conceptual Factors that Influence the Validity and Reliability of Interpretations

   a. Between Concepts and Variables

      (1) Failure to Adequately Represent Concept with Selected Variable(s)

      (2) For example, rearrests is an inadequate variable to fully represent the concept of recidivism, in part, because of the potential discrimination against prior felons in arrest practices.

   b. Between Variables and Measures

      (1) Failure to Adequately Represent Variables with Selected Measure(s)

      (2) For example, frequency of rearrest does not make possible any distinctions in regard to types of criminal offenses for which prior felons were rearrested.

2. Technical Factors that Influence Validity and Reliability

   a. Method of Collection

      (1) Measurement Error in Self-Reported Crime Data

         (a) Veracity/Concealment Problem

         (b) Exaggeration Problem

         (c) Memory Problem

         (d) Not Practical for Studying Serious Offenses

      (2) Measurement Error in Arrest Records

         (a) Underestimate "Actual" Incidence of Crime

         (b) Official data are more accurate as crimes get more serious.

   b. Type of Measure Sought (Fact or Perception)

   c. Source of Data, e.g., Administrative Record System, Public Opinion Poll, Census Document

   d. Use of Sample or Census

3. Management Factors that Influence Conceptual and Technical Threats to Validity and Reliability:

   - Time

   - Money

   - Organizational Considerations

   - Political Considerations

NOTES

a. An example of management influencing the conceptual adequacy of the problem is that political constraints may make it impossible to obtain information on reincarcerations from the state corrections agency.

b. An example of management influencing the technical adequacy of the problem is in measuring rearrests, self-reported crime data may be too time consuming and/or expensive to be obtained.

c. Planning the data collection effort will help to improve measurement accuracy by reducing conceptual, technical and managerial threats to validity and reliability.

II. DATA SOURCES

A. Alternative Data Sources

1. Primary Data:

Definition: Data you collect that are not currently available in easily usable form. Usually consists of individual records and can be obtained through surveys, polls or by developing a new data base from system records.

2. Secondary Data:

Definition: Data collected by others for different purposes than your analysis interest. These data are currently available in easily usable form. Secondary data are usually presented in aggregated form and can be obtained from:

- National Crime Panel
- Uniform Crime Reports
- Census Reports/Tapes
- Offender Tracking Reports
- Expenditure Reports

3. Factors Influencing the Selection of Primary and Secondary Data

NOTES

- Are there critical missing measures for the postulated hypotheses that require primary data?

- Is measurement error in secondary data sources of sufficient magnitude and concern to warrant primary data for which measurement error can be controlled?

- What time and resource constraints exist?

B. Primary Data Sources

1. Six Methods of Data Collection

Quickly go over the seven methods of collecting data, identifying their differences and giving examples of the more frequently used techniques.

a. Field Research

Direct observation of an agency, process or procedure, e.g., Peter Manning's work on police, Police Work: The Social Organization of Policing

b. Content Analysis

Systematic Study of Books, Articles and Documents

c. Experiments

Taking action by changing a process, activity or organization and observing the consequences of the change, e.g., Kansas City Preventive Patrol Experiment

d. Historical Research

Reconstruction of prior events to explain specific consequences, e.g., Roger Lane, "Victimization and Criminal Violence in the Nineteenth Century: Massachusetts as a Test Case," (Journal of Social History, Winter, 1968), pp. 156-163

e. Simulation Modeling

NOTES

Based on knowledge of the criminal justice system and/or criminal behavior, the construction of a computerized or non-computerized version of the processes. This model can then be observed and altered to simulate reality, e.g., Jan Chaiken, Criminal Justice Models: An Overview? (Rand, 1975). The work of Al Blumstein on JUSSIM and JUSSIM II.

f. Survey Research

Collecting responses to questions asked a sample or census of individuals or groups, e.g., Surveying Crime, National Research Council, National Academy of Sciences, 1977, and Marvin Wolfgang's research on Delinquency in a Cohort

1) Three frequently used types of surveys:

   a) Personal Interview

   b) Telephone Interview

   c) Mailed Questionnaire

2) Exhibit 1 summarizes comparative advantages/disadvantages for these three types of surveys. Participants may wish to use this as a reference. While they may disagree with the conclusions of the authors, answering the questions themselves may be of great value in selecting an approach.

Exhibit 1. A Comparison of Three Survey Methods

CRITERIA	PERSONAL INTERVIEW	MAILED QUESTIONNAIRE	TELEPHONE INTERVIEW
Inexpensive	no	yes	yes
Random sampling generally feasible	no	no	with RDD*
Entire spectrum of the population potentially contactable	yes	no	no
Sampling of special populations	yes	with list	sometimes
Easy to cover large geographic area	no	yes	yes
Control over who is actual respondent	yes	no	yes
High response rate	sometimes	no	yes
Easy call-backs and follow-ups	no	no	yes
Long interviews generally possible	yes	sometimes	sometimes
Explanations and probings possible	yes	no	yes
Visual materials may be presented	yes	yes	no
Nonthreatening to respondent	no	yes	yes
Interviewer can present credentials	yes	yes	no
Safe for interviewers	no	N.A.	yes
Easy supervision of interviewers	no	N.A.	yes

Source: Tachfarber, Alfred J.; Klecka, William R.; Random Digit Dialing: Lowering the Cost of Victimization Surveys; Police Foundation 1976.

* Random Digit Dialing

C. Secondary Data Sources

SHOW V.A. (2-2):

TYPES OF SECONDARY DATA

1. "Actual" Crime Data
2. Reported Crime Data
3. Public Opinion Data
4. Demographic Data
5. Systems Data
6. Juvenile Data

1. "Actual" Crime Data

   a. These data are indicators of the types and magnitude of crime.

   b. EXAMPLE: National Crime Panel and local victimization surveys.

2. Public Opinion Data

   a. These data are the perceptual or subjective indicators of crime or criminal justice services.

   b. EXAMPLE: national public opinion polls, political polls, local newspapers, also found in victimization surveys.

3. Reported Crime Data

   a. These data are official "crime statistics" on reported offenses and arrests.

   b. EXAMPLE: local police department records, state UCR, special study reports that may be developed by state or regional criminal justice planning agencies.

4. Demographic Data

   These are population statistics which refer to size, density and distribution of vital events, such as births and deaths.

5. System Data

   a. These data are statistics which relate to the organization and operation of the criminal justice system.

   b. EXAMPLE: Offender Based Transaction Statistics, management and administrative statistics and budget documents.

6. Juvenile Data

   a. These are data on various forms of juvenile behavior including criminal acts, quasi-criminal acts, and non-criminal behaviors.

   b. EXAMPLE: juvenile department reports, local police department reports, school records, juvenile court records, state child service agency records, federal data.

III. PLANNING FOR DATA COLLECTION

An example of planning a data collection effort is presented in the following Walk-Through.

DATA COLLECTION PLAN

PURPOSE

This walk-through is intended to involve participants in considering the process of preparing a data collection plan.

The Chaos Crime Planning Board has decided that in 1978 and 1979 it wants to concentrate its attention on one of the four most common offenses (Burglary, Theft, Assault and Robbery) reported to the police in Chaos City according to the FBI's Uniform Crime Reports.

A study conducted by the State's Crime Analysis Bureau reveals the rates per 100,000 population for these four offenses for 1976 and 1977 in Chaos. The study also presents comparisons with Tranquility, another city of comparable size in the state.

What can you say about the Chaos City crime problem based on these data?

Using the provided worksheet prepare a data collection plan to obtain the determined measures.

INSTRUCTOR NOTES

A. Begin the walk-through by explaining that its purpose is to prepare the basic components of a data collection plan. Also identify the specifics of the problem being examined, i.e., crime in Chaos City.

B. Go over Table 1, and the Worksheet and Table 2 of the Walk-Through and give the group five minutes to assess the data set.

C. Ask for answers to the first question: "What can be said about crime in Chaos City?"

   Note: The data indicate that the crime most frequently reported to police in Chaos City in both 1976 and 1977 was burglary. Burglary accounted for 42.9% of the total of the four crimes in 1976 and 45.7% of the total of the four crimes in 1977. Burglary not only was the most reported crime but also showed the highest rate of increase between 1976 and 1977 - 18.7%.

D. Tell the participants to consider additional data needed to address the problem. Have them look at Question 1 on the worksheet and to suggest additional measures, data sources, collection methods, comments on methods, other collection requirements and resource requirements. Have them fill in their worksheets as you proceed with the discussions. Do the same for each of the remaining questions on the worksheet. Refer to the Management Checklist in Table 2 throughout the Walk-Through.

E. Keep up a brisk pace going through the worksheet so that all the items are covered within the 30 minutes allotted for this walk-through.

DEBRIEFING

Stress how planning the data collection effort can improve measurement accuracy by minimizing conceptual, technical and managerial sources of error.

DATA SET

Table 1. State of Paradise, Four Crimes Reported to Police Most Frequently in Chaos and Tranquility, 1976 and 1977. (Per 100,000 population)

Crime Type	1976		1977	
	Chaos	Tranquility	Chaos	Tranquility
Burglary	1908	1201	2263	1363
Theft	872	1014	896	1052
Robbery	912	898	991	1054
Assault	761	521	807	533

Source: State of Paradise, Crime Analysis Bureau, 1978.

Table 2. Management Checklist for Data Collection

1. Determine Measures to be Used for Each Variable
2. Identify Major Categories of Needed Data
   a. Is appropriate data available?
   b. Is additional data required?
3. Identify and Assess Data Sources
   a. Will these data permit adequate interpretation of the hypotheses?
   b. Are the data reliable?
   c. Can they be obtained in time?
   d. How many data are required to clarify a problem?
   e. What is the most inexpensive data source?
4. Select Best Data Source
5. Identify Data Collection Methods
6. Determine Strengths/Weaknesses of Alternative Data Collection Methods
7. Select Best Data Collection Method
8. Consider Additional Requirements (If Applicable)
   a. Identify Authorization Requirements
   b. Identify Coding Requirements Process
   c. Develop Sampling Requirements
   d. Develop Instrument Requirements
   e. Develop Data Conversion Requirements
9. Determine Resource Needs

Table 3. Worksheet

Questions to be answered	Measures	Data Sources	Collection Method	Assessment Method	Other Collection Requirements	Resource Requirements
1. What is the magnitude of the crime problem?	• rates of crime by type	• Data Set	N.A.			N.A.
2. What is the direction and magnitude of the rate of change in the crime problem?	• rates of crime by type and year	• Data Set	N.A.			N.A.
3. How serious is the crime problem?	• weighted frequency of crime by type and year	• Offense Reports	Secondary Data Analysis	• Measurement error • Disaggregation		Little
4. In what areas of Chaos City is the incidence of crime the highest?	• frequency and rates of crime type and area of the city	• Arrest Reports • Census Maps	Secondary Data Analysis	• Measurement error • Disaggregation		Little
5. What is the Chaos City Police Departments/Courts capability for dealing with this problem?	• resource data • manpower allocation data • laws and regulations	• Agency Records • City Council Records • PROMIS	Secondary Data Analysis Simulation/Model	• Measurement error	• Secure Clearances and Authorization for Agency Heads • Estimating parameter • Initial values	Little Moderate
6. Who in Chaos City has been most seriously victimized and affected by the crime problem?	• victimization data	• victim survey • self reports	Survey Survey		• instrument • surveying • coding/editing data	Expensive
7. What are the possible causes of the crime problem?	• social, economic and demographic data • deterrence data • incident/victim/offender data	• Census Records • Victim Survey • Agency Records	Secondary Data, Analysis, Survey Secondary Data Analysis	• Measurement error		Little Expensive

WALK-THROUGH 'C'

IV. ASSESSING HYPOTHESES

As indicated previously, the refinement of concerns into concepts, variables, and measures usually produces many, rather than just one, hypotheses. Since many hypotheses may be constructed from a single concern, the analyst must identify the most appropriate hypotheses for subsequent analysis.

A. Criteria for Assessing Hypotheses

SHOW V.A. (2-3):

CRITERIA FOR ASSESSING HYPOTHESES

- Are the Hypothesis Comprehensive?
- Can the variables be measured?
- Are the measures accurate?
- Do the data support the measures?
- Is the hypothesis testable?
- Is the hypothesis important?

---

1. Comprehensiveness

   a. Hypotheses of a comprehensive problem statement should include, as appropriate, consideration of the following eight characteristics:

      Magnitude: Size, extent and/or importance of a problem.

      Rate of Change: Comparison of a problem in an earlier period of time to a later period.

Temporal Aspects: Cyclical nature or seasonality of the problem.

Seriousness: Amount of harm a problem inflicts on a community or person.

Targets: Considerations of the Victim, Offender, and/or Public.

Spatial Aspects: The geography of the problem.

System Response: Activities, programs, policies related to the problem.

Cause/Effect Relationships: The origins and evolution of the problem.

   b. Before beginning to collect and interpret data, it is necessary to consider the comprehensiveness of the problem specification. These characteristics can be used to help select the most appropriate hypotheses to pursue.

2. Measurability

   a. Possibly the most important criterion of a good hypothesis is whether the analyst can measure the variables stated in the hypothesis.

   b. Consider the statement, "There's a direct relationship between population increase and the incidence of armed robbery." Without good demographic data to describe population increase, the analyst can't test the hypothesis.

NOTES

3. Accuracy

   a. Even if variables can be measured, the hypothesis may be of questionable merit if the measures are unreliable or invalid.

   b. This criterion requires the application of an understanding of measurement, measurement error, data source, and data collection.

3. Data Availability

   a. Can all appropriate data be made available? Is there sufficient time, money, manpower, and technical capability to obtain appropriate data?

   b. Are there ethical, legal, or political constraints on data availability?

4. Testability

   a. Given the available data, is it possible to describe, compare, and make generalizations about the concerns?

   b. Is it possible, given the available data, to establish cause and effect relationships?

   c. Stating hypotheses in their simplest form and avoiding, when possible, complex multi-factor relationships will assist in making a hypothesis testable.

5. Importance

   a. Can the decision-makers affect the independent variables which have been identified?

   b. Are the hypotheses plausible and easily communicated?

B. Example of Assessing Hypotheses

Indicate that Task #2 of the Major Exercise will provide an opportunity for participants to apply these assessment criteria.

NOTES

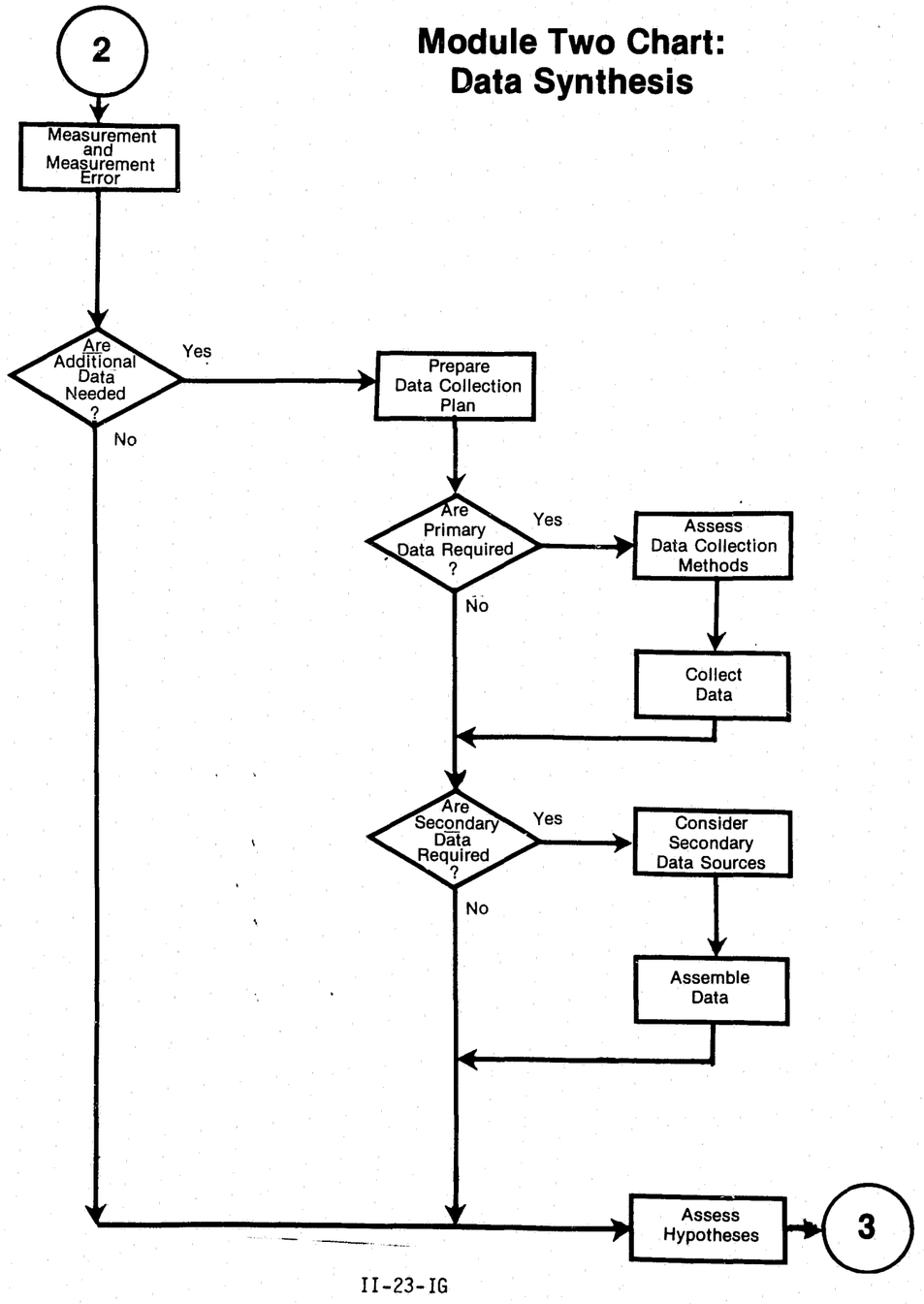
V. CONCLUSION

A. Refer participants to the module chart and quickly review the module. Ask whether there are questions about the content of Modules 1 or 2.

B. Indicate the schedule for the afternoon and show how it relates to the morning's activities. In Task #1 of the Major Exercise participants are required to specify a problem, and in Task #2 they are asked to assess the developed hypotheses.

SHOW V.A. (2-4):

Module Two Chart: Data Synthesis



MODULE 3
DESCRIPTIVE METHODS

Modules 3, 4, and 5 concentrate on tools -- descriptive, comparative, and inferential statistics -- needed for the interpretation of data. The emphasis is on developing statistical skills, on learning how the results of various calculations are used to interpret data, and on knowing when to use each tool.

The exercise and walk-throughs are designed to give practical opportunities for the participants to apply the knowledge and skills developed in this module.

Pacing is critical in this module inasmuch as it is very elementary material. Instructors should make every effort to minimize time spent on the lectures in this module. In presenting the various statistical methods, instructors should emphasize practical applications, rules to follow in using the techniques and the interpretation of the results of statistical calculations.

Facilitators for the exercises and instructors should carefully pace the Exercises and Walk-Throughs. If the descriptive material is clearly understood by the audience, move through this section quickly; if a few individuals are having particular difficulty with the material, special efforts should be provided so that they can keep up with the group.

The material for this module covers basic descriptive statistics, the use of tables, graphs and charts, and concludes with a presentation of percent change.

OBJECTIVES - MODULE 3
DESCRIPTIVE METHODS

1. Understand the different levels of measurement and apply them to select appropriate quantitative methods.

2. Select, calculate and interpret:

   a. Mean
   b. Median
   c. Mode
   d. Frequency and Percent Tables
   e. Standard Deviation
   f. Percent Change

3. Select, construct and interpret:

   a. Pie Charts
   b. Bar Graphs
   c. Histograms
   d. Frequency Polygons
   e. Time Charts

SCHEDULE - MODULE 3
DATA INTERPRETATION -- DESCRIPTIVE METHODS

TIME ALLOCATION

* Less than 5 minutes

NOTES

I. MEASUREMENT LEVELS

A. Definition of Measurement Levels (refer to Exhibit 3-1)

1. Definition: The way we measure affects what we can do with our data once it has been collected. The symbols we assign correspond to how much we know about the values observed. This is called the level of measurement.

2. When all we know about the relationship between the symbols assigned is that they belong to different categories, e.g., religions. This level of measurement is called nominal and it allows us to say that two observations are the same or different, once measured.

3. If we know more about the relationships between categories, not merely that they are different, but that they are somehow ordered, we have ordinal measurement.

   a. Example: Police authority when measured by rank -- sergeant, lieutenant, captain -- may be considered an ordinal measure.

   b. Example: Another example is the FBI's ten most wanted men/women. This list tells us that the most wanted is wanted more than the second but does not tell us how much more wanted.

4. If one additional piece of information is added about the size of the difference between each category, we have what is called interval level data.

   a. An example of an interval level measure is time.

   b. The size of the difference between the categories is meaningful. For example, six o'clock can be described as two hours later than four o'clock.

5. The highest level of measurement, ratio scale, has all the properties of the interval scale plus it has a true and absolute or fixed zero point.

NOTES

Example: Examples of interval level measures are criminal justice expenditures, age, sentence length.

6. It is important to note that observed data, by itself, has no level of preordained measurement.

   a. Example: The number 6 could be a:
      - label (box 6)
      - order (6th)
      - interval (6 degrees)
      - or ratio figure ($6)

   b. Example: As a second example, type of weapon, which is usually measured on a nominal scale, could be ordered, to reflect how lethal a weapon it is (potentially or actually).

   c. The level of measurement used is as much a function of what we know about the concept we are measuring, as it is of our ability to measure.

7. Nominal data is typically referred to as qualitative or categorical. Ordinal, interval, and ratio are typically called quantitative.

Exhibit 1. Measurement Scales

TYPE	LEVEL	DESCRIPTION	EXAMPLES	STATISTICS FREQUENTLY USED
Qualitative	Nominal	Data are placed in mutually exclusive and exhaustive categories.	Sex Race Type of Crime Type of Weapon	Tables of frequencies and rates Mode Pie Charts Bar Graphs Cross tabulation tables Chi square
Quantitative	Ordinal	Data are placed in mutually exclusive and exhaustive categories, ordered along a continuum according to a hierarchy.	Socio-economic status Ranks in law enforcement agency	
	Interval	Data are distributed along a continuum with established distances between points with no reference to an absolute zero.	Time Temperature Intelligence	Mean Median Range Standard Deviation Statistical Maps Histograms Time Charts Rates Pearson's r Regression Scattergrams
	Ratio	Data are distributed along a continuum with established distances between points with an absolute zero.	Age Years of Education	

B. Utility of Measurement Levels

1. Specifying the level of measurement dictates how we can interpret and compare observations on our data.

2. Examples:

   a. With ratio dollar loss data we can say a $500 average dollar loss is twice that of a $250 loss per crime.

   b. With dollar loss figures which are also interval, we can say that a loss of $100 is $75 more than a loss of $25.

   c. With ordinal data on formal authority in a police department, we can say that a captain has more formal authority than a patrol officer.

   d. With nominal crime type data we can say that a burglary is not an obscene phone call.

3. Different statistical techniques are appropriate for data at different levels of measurement. We can say more about data about which we know more in the first place. Because of this, the most powerful statistical techniques are appropriate only for the higher levels of measurement, interval and ratio data.

II. STATISTICAL METHODS

Note that there are two basic ways for statistically describing data: (1) central tendency and (2) dispersion. Central tendency refers to identifying, in a single summary number, a "typical" case. Dispersion refers to identifying how spread out a distribution of observed values is. A distribution is a list of data, produced by measuring a variable of interest, for more than one case.

A. Measures of Central Tendency

More than one way of representing what constitutes a "typical" or average case.

1. Mean

   a. The mean is the sum of all observed values, divided by the number of cases.

SHOW V.A. (3-1):

MEAN

SUM UP VALUES AND DIVIDE BY THE NUMBER OF VALUES.

$$\bar{X} = \frac{\Sigma X}{N}$$

$\bar{X}$ = MEAN

Σ = "SUMMATION" OR "SUM UP"

X = INDIVIDUAL VALUE

N = NUMBER OF VALUES

EMPHASIZE (3-1):

+ These symbols will be used throughout modules 3, 4, 5 and 6.

+ N = number of cases in the distribution

+ x = an observed value, one case from a distribution.

+ Σ = Sigma = summation symbol meaning to add together.

SHOW V.A. (3-2):

MEAN

EXAMPLE: MURDER RATES (PER 100,000 POPULATION) FOR FIVE WESTERN CITIES FOR 1971.

CITY	MURDER RATE (X)
SEATTLE	4
BOISE	5
SACRAMENTO	6
DENVER	8
SAN FRANCISCO	8
N = 5	$\Sigma X = 31$

$$\bar{X} = \frac{\Sigma X}{N} = \frac{31}{5} = 6.2 \text{ MURDERS}$$

EMPHASIZE (3-2):

+ Go through calculations
+ Summary measure of the "typical" observation
+ Allows comparison
+ Economically conveys information

b. The mean is appropriate only for interval or ratio level data because it makes use of information about the distance between each observation.

c. The mean is greatly affected by extreme values. If one additional case is added to distribution, for example 29, the mean will be:

$$\frac{\Sigma X}{N} = \frac{60}{6} = 10$$

The addition of one extreme case has yielded a mean, a "typical case", which is larger than all of the other cases in the distribution. The mean is still valid, but caution is required in its interpretation. One must always be on the lookout for extreme values.

d. The mean is useful as a standard for comparison.

2. Median

a. The median is the "middle" value of a distribution; i.e., there are an equal number of cases greater than and less than the median.

SHOW V.A. (3-3):

MEDIAN

WHEN CONTINUOUS DATA HAVE BEEN ORDERED OR RANKED (e.g., FROM LOW TO HIGH), THE MEDIAN IS THE MIDDLE VALUE.

CITY	MURDER RATES *	
Seattle	4	
Boise	5	
Sacramento	6	← MEDIAN
Denver	8	
San Francisco	8	

MDN = 6

Source: Sourcebook, 1976
*per 100,000

EMPHASIZE (3-3):

+ Median is the middle value.
+ Median of this distribution is .2 less than the mean which is 6.2.

SHOW V.A. (3-4):

MEDIAN

WHEN THERE ARE AN EVEN NUMBER OF VALUES IN THE RANKED LIST, THE MEDIAN IS THE ARITHMETIC MEAN OF THE TWO MIDDLE VALUES.

CITY	MURDER RATES *
Seattle	4
Boise	5 }
Sacramento	6 }
Denver	8

$$MDN = \frac{5+6}{2} = \frac{11}{2} = 5.5$$

Source: Sourcebook, 1976
*per 100,000

EMPHASIZE (3-4):

+ With an even number of cases there is no middle value.

+ Solution is the $\bar{X}$ of the two middle values.

b. For this reason, the median is typically used as a preferred measure of central tendency where there are extreme values in a distribution, for example, as in income.

c. The median is time consuming to calculate because it requires the distribution to be rank-ordered.

3. Mode

a. The mode is simply the most frequently occurring value in a distribution.

NOTES

SHOW V.A. (3-5):

MODE

THE VALUE THAT OCCURS MOST FREQUENTLY.
THE MODE MAY BE USED WITH BOTH QUALITATIVE AND CONTINUOUS DATA.
MORE THAN ONE MODE MAY OCCUR IN A DISTRIBUTION.

CITY	MURDER RATES	
Seattle	4	
Boise	5	
Sacramento	6	
Denver	8	
San Francisco	8	MODE = 8

Source: Sourcebook, 1976
*per 100,000

EMPHASIZE (3-5):

+ Another summary measure of the "typical" case.

+ Contrast the three measures Mean = 6.2
Median = 6 Mode = 8

b. Unlike the mean and the median, the mode is always a real observed value. It is totally unaffected by extreme values.

c. The mode is the best measure of central tendency for nominal data. For interval or ordinal data it ignores all of the other information about the distribution of values in the data set.

d. In (3-6), the mode is higher than all of the other observations in the data set. It is in a real sense, "typical," but the mode is limited in its usefulness.

MEAN, MEDIAN, MODE

PURPOSE

To show participants how to calculate measures of central tendency and to illustrate the effects of extreme scores on measures of central tendency.

The data set on murder rate (in three variations) are to be rank ordered and means, medians, and modes are to be calculated for each variation. This Walk-Through should last no longer than 10 minutes.

INSTRUCTOR NOTES

A. Tell the participants to follow the steps on their worksheet.

B. Go through the steps of (a) rank ordering the data, (b) calculating the mean, (c) calculating the median, and (d) calculating the mode for the data set.

C. Do the same for the variation where the Las Vegas data are left out.

D. Do the same for the variation where the Las Vegas data are left out and the Baltimore data is added.

E. Point out how the measure of central tendency can be altered significantly by addition or subtraction of data, as indicated in the given answers on the worksheet.

F. Explain significant decimal places and rounding off of numbers. How many decimal places is a matter of convention. For a data set like the one used in this Walk-Through, working with whole numbers, one or two decimal places in the answer is often used. Whatever convention established, be consistent.

G. There are rules for rounding. If the last digit you wish to use

- is less than 5, round down.
- is greater than 5, round up
- is exactly 5, round down if the next digit to the left is odd, round up if even.

H. Fifteen minutes have been allotted for this Walk-Through.

DATA SET

City	Murder Rate (x)*
Boise	5
Denver	8
Las Vegas	18
Sacramento	6
San Francisco	8
Seattle	4

*Indicates per 100,000 inhabitants

WORKSHEET

A. Rank-order the data.

City	Murder Rate (x)
Seattle	4
Boise	5
Sacramento	6
Denver	8
San Francisco	8
Las Vegas	18

B. Calculate the mean, median and mode.

1. Mean

$$\overline{X} = \frac{\Sigma X}{N} = 8.16$$

2. Median

Median = 7

3. Mode = 8

C. Leaving out Las Vegas, Rank-order the data.

City	Murder Rate (x)
Seattle	4
Boise	5
Sacramento	6
Denver	8
San Francisco	8

D. Calculate the mean, median and mode.

Mean

$$\overline{X} = \frac{\Sigma X}{N} = 6.2$$

Median = 6

Mode = 8

WORKSHEET Continued

E. Still leaving out Las Vegas, add the city of Baltimore (murder rate/100,000 inhabitants = 4)

F. Rank-order the data set.

City	Murder Rate (x)
Baltimore	4
Seattle	4
Boise	5
Sacramento	6
Denver	8
San Francisco	8

G. Calculate the mean, median and mode.

Mean

$$\overline{X} = \frac{\Sigma X}{N} = 5.8$$

Median = 5.5

Mode = 4, 8

WALK-THROUGH 'D'

B. Measures of variation

Measures of variation provide information on how spread out a distribution is.

1. Frequency tables.

SHOW V.A. (3-6):

TABLES OF FREQUENCIES AND PERCENTS

USED WITH DISCRETE OR QUALITATIVE DATA.
ALSO USED WITH CONTINUOUS DATA THAT HAVE BEEN GROUPED INTO CATEGORIES.

f = FREQUENCY OF CASES IN A CATEGORY

$$\% = \frac{\text{NUMBER OF CASES IN A GIVEN CATEGORY}}{\text{TOTAL NUMBER OF CASES}} \times 100$$

EMPHASIZE (3-6):

+ Frequency tables display the count of cases in each category.
+ Percentaging the frequencies allows us to standardize the frequencies to allow for easy comparison.

SHOW V.A. (3-7):

TABLES OF FREQUENCIES AND PERCENTS

EXAMPLE:

TYPES OF ROBBERIES IN CHAOS CITY FOR 1974

TYPE	f	%
ROBBERY/ATTEMPTED ROBBERY W/INJURY	5	33.3
ROBBERY W/OUT INJURY	8	53.3
ATTEMPTED ROBBERY W/OUT INJURY	2	13.3

$$\% \text{ FIRST CATEGORY} = \frac{5}{15} \times 100 = 33.3\%$$

Source: Hypothetical Data

EMPHASIZE (3-7):

* Because of rounding error, percentages add up to 99.9 percent.
* This is interpreted (the distribution of robbery in Chaos City with regard to injury) as meaning:

  (1) no injury in 66.6% of the cases.
  (2) injury in 33.3% of the cases.

---

2. Range

SHOW V.A. (3-8):

RANGE

THE DIFFERENCE BETWEEN THE HIGHEST AND LOWEST VALUES IN A DISTRIBUTION OF CONTINUOUS VALUES.

RANGE = MAXIMUM VALUE – MINIMUM VALUE

EXAMPLE:

CITY	MURDER RATE
Seattle	4
Boise	5
Sacramento	6
Denver	8
San Francisco	8

RANGE = 8 – 4 = 4

Source: Sourcebook, 1976
*per 100,000

EMPHASIZE (3-8):

+ This is same data used to illustrate central tendency.
+ When reporting a range, also report the minimum and maximum values. Two distributions can have same range but vary widely in size.
+ Range emphasizes extremes and often is used to emphasize a point.
+ Range totally ignores non-extreme values.

3. Standard Deviation

a. Standard deviation is useful in describing interval or ratio data.

b. Formula for Standard Deviation.

SHOW V.A. (3-9):

STANDARD DEVIATION

A COMMONLY USED MEASURE OF DISPERSION OR VARIABILITY IN A DISTRIBUTION OF CONTINUOUS DATA

$$SD = \sqrt{\frac{\Sigma (X - \bar{X})^2}{N}}$$

EMPHASIZE (3-9):

+ More than one formula can be used for the standard deviation.
+ Standard deviation is based on the mean.

SHOW V.A. (3-10):

STANDARD DEVIATION

MURDER RATES FOR FIVE WESTERN CITIES

MURDER RATE*

X	$X - \bar{X}$	$(X - \bar{X})^2$
4	−2.2	4.84
5	−1.2	1.44
6	− .2	.04
8	1.8	3.24
8	1.8	3.24
$\Sigma X = 31$		$\Sigma(X - \bar{X})^2 = 12.80$

$$\bar{X} = \frac{31}{5} = 6.2 \qquad SD = \sqrt{\frac{\Sigma(X - \bar{X})^2}{N}}$$

$$SD = \sqrt{\frac{12.80}{5}} = 1.6$$

Source: Sourcebook, 1976 *per 100,000

EMPHASIZE (3-10):

+ The sum of deviations from the mean always equals 0.
+ Squaring gets around this problem.
+ Variance is an important statistic; explaining the variance in a set of data is an important activity; inferential statistics is concerned with explaining variance.
+ A square root of the variance converts the "units squared" of variance to simple unit counts.

STANDARD DEVIATION

PURPOSE

To show participants how to calculate and interpret a standard deviation.

The data set on murder rate (in two variations) is to be rank-ordered and standard deviations calculated for each variation.

INSTRUCTOR NOTES

A. Tell the participants to follow the steps on their worksheet.

B. Go through the steps of (a) rank ordering the data, (b) finding the range, (c) calculating required values on worksheet, and (d) calculating the standard deviation for the data set.

C. Do the same for the variation in which the Las Vegas data is left out.

D. Briefly explain to the participants the reasons why the values of these measures of variation change so dramatically from one "sample" to the next, i.e., the sensitivity of the $\bar{x}$ and SD to extreme values in a distribution.

E. Fifteen minutes are allotted for this Walk-Through.

DATA SET

City	Murder Rate (x)
Boise	5
Denver	8
Las Vegas	18
Sacramento	6
San Francisco	8
Seattle	4

*Indicates per 100,000 inhabitants.

WORKSHEET

A. Rank-order the data.

City	Murder Rate (x)
Seattle	4
Boise	5
Sacramento	6
Denver	8
San Francisco	8
Las Vegas	18

B. Find the range. Range = 14

C. Develop worksheet and calculate required values.

X	$\overline{X}$	$X-\overline{X}$	$(X-\overline{X})^2$
4	8.17	-4.17	17.39
5	8.17	-3.17	10.05
6	8.17	-2.17	4.71
8	8.17	- .17	.03
8	8.17	- .17	.03
18	8.17	9.83	96.63

$\Sigma X = 49$ $\Sigma(X-\overline{X})^2 = 128.84$

$\overline{X} = \frac{\Sigma X}{N} = 8.17$

D. Substitute in formula: $SD = \sqrt{\frac{\Sigma(X-\overline{X})^2}{N}}$

$SD = \sqrt{\frac{128.84}{6}} = 4.63$

WORKSHEET (continued)

E. Leaving out Las Vegas, develop a new worksheet and calculate required values.

X	$\overline{X}$	$X-\overline{X}$	$(X-\overline{X})^2$
4	6.2	-2.2	4.84
5	6.2	-1.2	1.44
6	6.2	- .2	.04
8	6.2	1.8	3.24
8	6.2	1.8	3.24

$\Sigma X = 31$ $\Sigma(X-\overline{X})^2 = 12.80$

F. Find the range: Range = 4

G. Find the Mean: $\overline{X}$ =

H. Find the standard deviation:

$SD = \sqrt{\frac{\Sigma(X-X)^2}{N}}$

$SD = \sqrt{\frac{12.8}{5}}$

SD = 1.6

WALK-THROUGH 'E'

NOTES

III. GRAPHICAL METHODS

Graphics can potentially convey enormous amounts of information in a very compact form with a clarity and force in a way which lists of data or tabular presentations cannot. Three basic types of graphical presentations for frequency distributions and percentaged data are presented:

a. Pie Charts
b. Bar Graphs
c. Frequency Polygons or Line Graphs

All of these graphic representations display frequencies and percentages in a way which makes comparison between categories easy, and have impact.

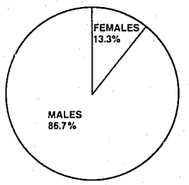
A. Pie Charts

SHOW V.A. (3-11):

PIE CHART

SEX	f	PROP	%	DEGREES
MALE	13	$\frac{13}{15} = 0.867$	86.7	(0.867)(360°) = 312°
FEMALE	2	$\frac{2}{15} = 0.133$	13.3	(0.133)(360°) = 48°

SEX OF ROBBERY OFFENDERS



Source: Hypothetical Data

EMPHASIZE (3-11):

+ Point out that male robbery offenders far outnumber female offenders
+ Show the process of dividing up pie as illustrated.

NOTES

B. Bar Graphs

SHOW V.A. (3-12):

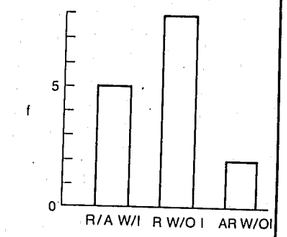
BAR GRAPHS

Used to portray qualitative data. A vertical or horizontal bar is used to represent the number of observations in a given category.

EXAMPLE:

TYPES OF ROBBERIES

TYPE	f
ROBBERY/ATTEMPT W/INJURY	5
ROBBERY W/OUT INJURY	8
ATTEMPTED ROBBERY W/OUT INJURY	2



Source: Hypothetical Data

EMPHASIZE (3-12):

+ Point out that the graph shows the relative size of each robbery category
+ Demonstrate the process of constructing bars

Rules for Constructing Bar Graphs

1. Place categories along the horizontal axis; frequencies on the vertical axis.
2. For clarity of presentation, leave a space between each category bar.
3. Keep bars a uniform width and avoid an excessive number of categories.

C. Histograms

SHOW V.A. (3-13):

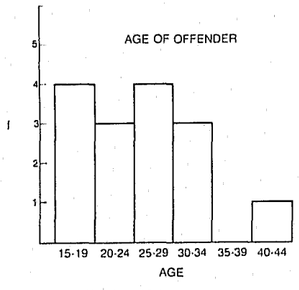
HISTOGRAM

A graphic representation of a grouped distribution

EXAMPLE:

AGE OF OFFENDER

AGE	f
15-19	4
20-24	3
25-29	4
30-34	3
35-39	0
40-44	1



Source: Hypothetical Data

EMPHASIZE (3-13):

+ Emphasize that with grouped data be cautious

  (1) Collapsing or grouping data throws out information.

  (2) Its not clear if all of the 15-19 year olds are 19 or possibly 15 years old.

  (3) We lose all information about the distribution within each class by grouping data.

+ Point out the process for constructing a histogram consists of the following steps:

  (1) First, establish categories of the variable of interest.

  (2) Second, set up class limits of equal size. In this example, each class interval will be 5 years wide.

  (3) Finally, complete the grouping process by combining the frequencies or counting the number of cases falling into each category to be displayed.

+ The resulting histogram looks like any other bar graph, except that no space is left between the bars. This reflects the fact that continuous data is being used.

+ The histogram is drawn using apparent interval limits. In Exercise 1 participants will be asked to establish real interval limits, e.g., age category 15-19 years expressed with real interval limits is 14.5 to 19.5. This should be explained to the participants.

D. Frequency Polygons

SHOW V.A. (3-14):

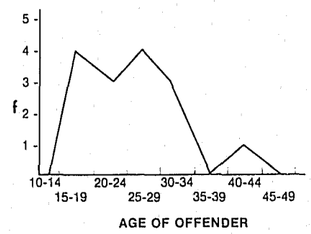
FREQUENCY POLYGON

A graphic representation of a grouped distribution using midpoints of categories with lines connecting the points of the graph.

EXAMPLE:

AGE OF OFFENDER

AGE	f	MIDPOINT
10-14	0	12
15-19	4	17
20-24	3	22
25-29	4	27
30-34	3	32
35-39	0	37
40-44	1	42
45-49	0	47



Source: Hypothetical Data

EMPHASIZE (3-14):

+ The information in a histogram can be represented in the form of a line graph called a "frequency polygon" by connecting the midpoint of each category.

NOTES

+ The frequency polygon has the advantage of allowing the plotting of more than one distribution on the same set of axes. This facilitates comparison.

+ Provides a clear comparison for two or more frequency distributions.

+ Easily communicates information about a large number of data points.

+ Emphasizes distribution as a whole.

+ Not for use with nominal data.

+ May lose its shape when a smaller number of intervals is used and when interval size is large.

+ Information is lost when data are grouped.

+ Intervals must be exhaustive.

+ Height may be misleading.

EXERCISE #1

PURPOSE

To give participants an opportunity to practice constructing and interpreting tables, charts and graphs.

INSTRUCTIONS

Using the provided crime data, construct the specified graphs and figures. Be sure to completely label each graph or chart and prepare a one or two sentence narrative that highlights the findings of each chart or graph.

Specifically,

(1) For Race of Offender, Construct:

* A Frequency Table
* A Pie Chart

(2) For Type of Weapon, Construct:

* A Frequency Table
* A Bar Graph

(3) For Age of Victim, Construct:

* Complete the Grouped Data Table
* A Histogram
* A Frequency Polygon

INSTRUCTOR NOTES

A. Tell participants they will be using crime data to construct the three required tables.

B. Have them construct the first chart.

C. Have them finish constructing the remaining two graphs and then interpret each.

D. Schedule:
Preparation (5 min.)
Activity (25 min.)
Debriefing (5 min.)

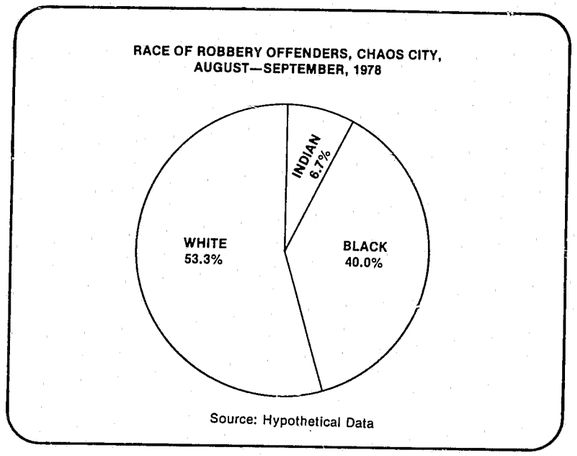
A. Race of Offender

1. Construct a Frequency Table.

Race of Offender	Frequency	Percent
White	8	53.3
Black	6	40.0
Indian	1	6.7

2. Construct a Pie Chart.

SHOW ANSWER (Exercise 1-a):



EXERCISE #1

EXERCISE #1 (Continued)

B. Type of Weapon

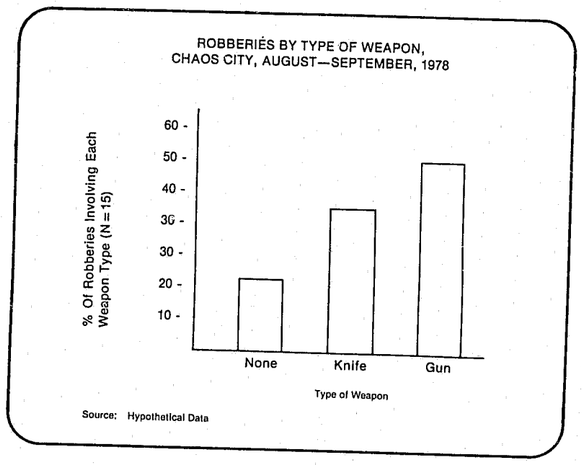
1. Calculate required values and complete the following table.

Weapon Type	Frequency	Percent
Knife	5	33.3%
Gun	7	46.7%
None	3	20.0%

Source: Hypothetical Data

2. Construct a Bar Graph.

SHOW ANSWER (Exercise 1-b):



EXERCISE #1

C. Age of Victim

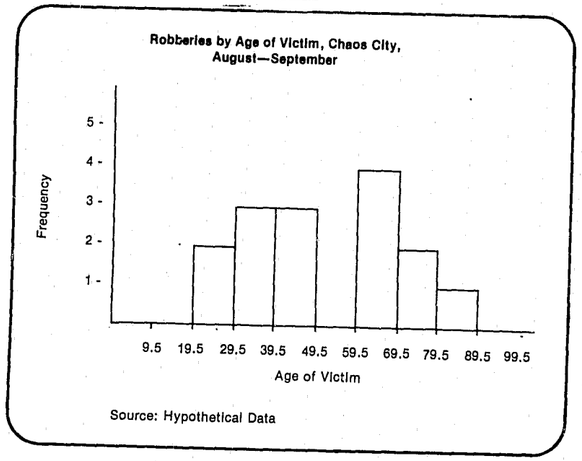
1. Examine the following grouped data table.

Age of Victim (Apparent Interval Limits)	Frequency	Real Interval Limits	Mid-point
10 - 19	0	9.5 - 19.5	14.5
20 - 29	2	19.5 - 29.5	24.5
30 - 39	3	29.5 - 39.5	34.5
40 - 49	3	39.5 - 49.5	44.5
50 - 59	0	49.5 - 59.5	54.5
60 - 69	4	59.5 - 69.5	64.5
70 - 79	2	69.5 - 79.5	74.5
80 - 89	1	79.5 - 89.5	84.5
90 - 99	0	89.5 - 99.5	94.5

EXERCISE #1

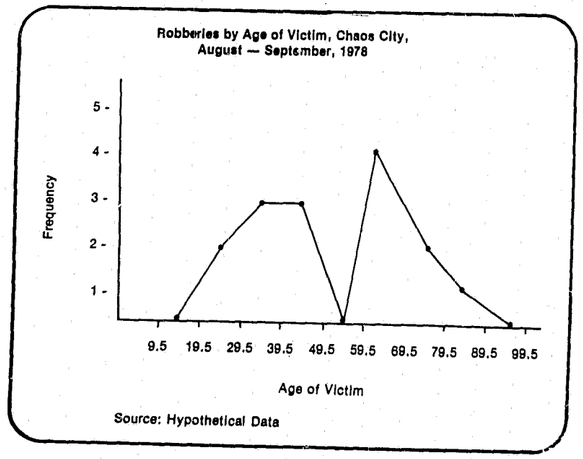
2. Prepare a histogram using the grouped data.

SHOW ANSWER (Exercise 1-c):



3. Prepare a frequency polygon using the grouped data.

SHOW ANSWER (Exercise 1-d):



EXERCISE #1

IV. TIME CHARTS AND PERCENT CHANGE

Module 3 concludes with the introduction of time as an important dimension for use in the description of crime data. Module 4 will add space and seriousness as two more important considerations. Change, or the lack of it, in crime rates across time is a major indicator that the criminal justice system responds to, and uses as one indicator of its performance.

A. Percent Change

SHOW V.A. (3-15):

PERCENT CHANGE

$$\text{PERCENT CHANGE} = \frac{\text{CRIME IN LATER PERIOD-CRIME IN EARLIER PERIOD}}{\text{CRIME IN EARLIER PERIOD}} \times 100$$

EXAMPLE:

REPORTED ASSAULTS* – 1970: 1128
1974: 1463

$$\%\ \text{CHANGE} = \frac{1463-1128}{1128} \times 100 = 29.7\%$$

Source: Hypothetical Data
*per 100,000

EMPHASIZE (3-15):

+ Basic to measuring change is the use of a percentage change measure.

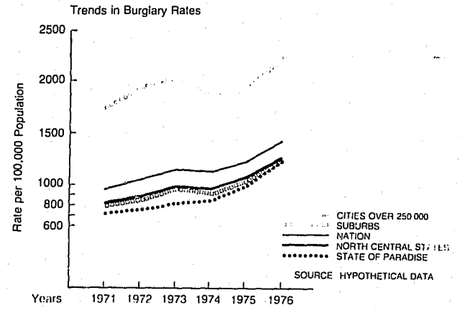
+ This measure expresses the change from an earlier period as a percent of the value at earlier period.

+ There are other formulas for calculating percent change.

B. Time Charts

SHOW V.A. (3-16):

TRENDS IN BURGLARY RATES BY URBAN SIZE, UNITED STATES AND STATE OF PARADISE, 1971-1976



EMPHASIZE (3-16):

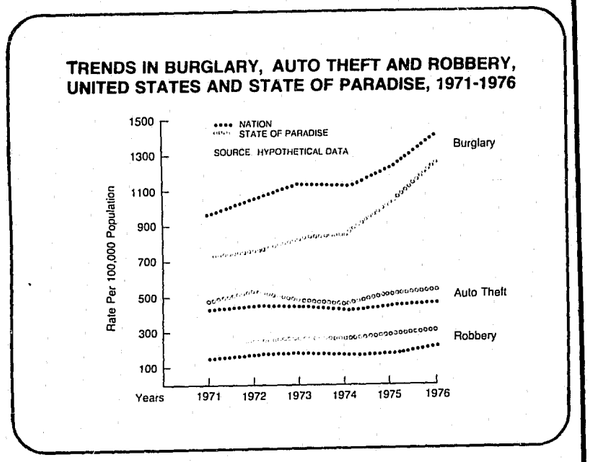
+ Trends in crime rates can be easily compared for different jurisdictions if the trends for each jurisdiction are plotted on the same set of axes.

+ Note the use of different kinds of lines to identify each jurisdiction.

+ Note that our hypothetical cities over 250,000 population have roughly twice the crime rate of the other jurisdictions, but its time trend follows the same basic shape as the other jurisdictions.

+ Point out what an "interrupted time-series" is using 1973 to illustrate.

SHOW V.A. (3-17):



EMPHASIZE (3-17):

+ Not only can several different jurisdictions be represented on a single graphic, but several different categories of crime can be represented at the same time.

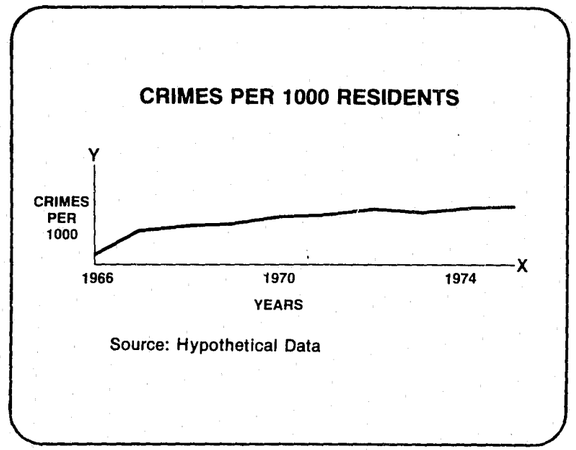
+ Note that the State of Paradise represented by the line made up of hollow circles has a lower burglary rate and higher auto theft and robbery rates than the nation, and that these rates of change remained constant between 1971 and 1976.

C. Distorting Graphical Presentations

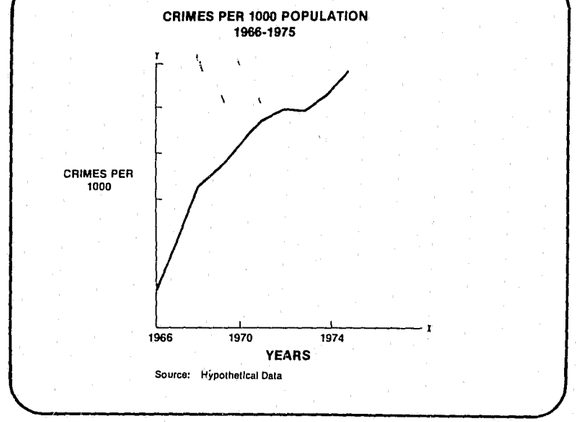
1. The 3/4 rule--Y axis should be between 75-100% of the X axis.

   The following three graphs illustrate violations of the 3/4 rule.

SHOW V.A. (3-18):



SHOW V.A. (3-19):



EMPHASIZE (3-19):

+ Beware of changing measurement definitions or techniques.

+ May require adjustments of data when using time intervals of different lengths.

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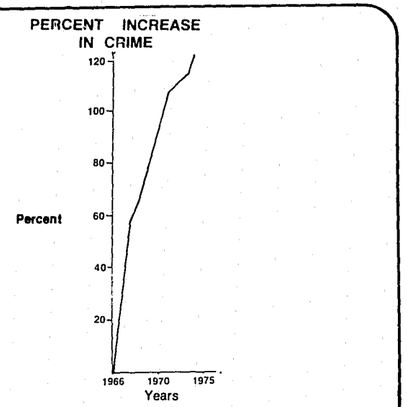
2. Another deceptive practice is to utilize percent change data without proper warning to the reader.

SHOW V.A. (3-20):



Source: Hypothetical Data

EMPHASIZE (3-20):

+ Violation of 3/4 rule.

+ Reference Huff's "How to Lie with Statistics."

V. CONCLUSION

A. Refer to module chart and questions. Review the major topics. Indicate that Module 4 will provide tools for comparing variables, such as, time, and crime rates, space, and seriousness.

B. In the actual conduct of analysis, as in the Major Exercise, the Task dealing with Descriptive Statistics should be done as a first step in interpreting the data. When presenting information to decision-makers, descriptive statistics are useful to summarize and communicate findings to decision-makers.

MODULE 4
COMPARATIVE METHODS

Module 4 examines a number of comparative techniques used to describe crime and system problems. The module begins by presenting four basic indices, moves through a discussion of the Wolfgang-Sellin Seriousness Index, discusses the use of cross classification tables and scattergrams, and concludes with a presentation of statistical maps.

SCHEDULE

COMPARATIVE METHODS

TIME ALLOCATION

TOPIC	TIME	PAGE
I. INDEX NUMBERS	25 minutes	IV-4
A. Rates	5 minutes	IV-4
B. Four Types	10 minutes	IV-5
C. Comparative Analysis	*	IV-13
Walk-Through 'F' INDEX NUMBERS	10 minutes	IV-14
II. SERIOUSNESS WEIGHTING	60 minutes	IV-16
A. Need	5 minutes	IV-16
B. Sellin-Wolfgang Index	10 minutes	IV-17
C. Uses of Seriousness Scale	*	IV-20
Exercise #2 SERIOUSNESS	45 minutes	IV-21
III. CROSS CLASSIFICATION	30 minutes	IV-25
A. Purpose	5 minutes	IV-25
B. Example	5 minutes	IV-25
C. Percentaging a Table	5 minutes	IV-27
Walk-Through 'G' CROSS CLASSIFICATION TABLES	15 minutes	IV-28
IV. SCATTERGRAMS	50 minutes	IV-31
A. Definition	5 minutes	IV-31
B. Construction/Interpretation	5 minutes	IV-31
Walk-Through 'H' SCATTERGRAM	10 minutes	IV-32
Exercise #3 SCATTERGRAM	30 minutes	IV-36
V. STATISTICAL MAPS	10 minutes	IV-40
A. Importance	*	IV-41
B. Principals	*	IV-42
C. Spatial Characteristics	5 minutes	IV-43
VI. CONCLUSION	5 minutes	IV-47
TOTAL TIME	180 minutes	

* Less than 5 minutes

OBJECTIVES - MODULE 4
COMPARATIVE METHODS

1. To summarize and compare variables using concentration, distribution, density, and unit share indices.
2. To explain and apply a seriousness scale.
3. To develop and interpret cross classification tables.
4. To prepare and explain a scattergram.
5. To explain what a statistical map is and identify spatial patterns in data.

I. INDEX NUMBERS

An index number consists of a:

numerator
denominator

It is a ratio of two measures.

A. Rates

1. The concept of rates is familiar to most criminal justice practitioners, e.g. crime rate, arrest rate, clearance rate, conviction rate, and recidivism rate. In fact, most of these notions are so well known that planners and analysts often fail to question the way that a particular rate is constructed or to examine carefully what a rate or index really measures and how it is applied. This is especially true of Part I Offenses.

Ask participants what are appropriate population-at-risk denominators for Part I Offenses. How might these denominators vary by location, e.g. Central City?

2. Example: As an example, crime rate is commonly distinguished from incidence in that the former represents a standardized version of the latter. That is, crime counts within a geographic unit are divided by the population of the unit (thus arriving at a rate per capita), and the result is multiplied by 100,000 or some other scaling factor to make the results somewhat easier to interpret. In this way, geographic units of different populations are made more comparable through a standardizing process.

3. Deriving crime rates as described above represents one way of achieving comparability. When this method is used for specific crimes, however, the meaning of "rate" is to be interpreted as a "risk" of victimization. Greater care must be taken in choosing the denominator which is used to calculate the rate. For example, in a calculation of the rate of forcible rape as a risk of being the victim of such a crime, the number of rapes reported could be divided by the number of females (in the age group where the event would be legally defined as rape) residing in the geographic unit, rather than by the total population. Similarly, the risk of auto theft could be estimated by dividing the number of autos stolen by the number of autos that could be stolen i.e., the number of registered autos. Thus, while there is nothing inherently "wrong" in dividing the incidence of different types of crime by population (or area) to arrive at a rate, analysts should always be cognizant of what the result really means and how it is to be interpreted.

4. The following denominators should be considered:

Rape/Females
Auto Theft/Cars
Central City/population during day

B. Four Types of Index Numbers

1. Density Index

a. Definition: Density indices reflect population counts per unit area.

$$\text{Density Index} = \frac{\text{Number of Delinquent Juveniles in Chaos City}}{\text{Number of Square Miles in Chaos City}}$$

b. Density is particularly important for aggregate statistics, because it standardizes for size of area. Thus, political or administrative areas (e.g., states, counties, cities, police districts, and census tracts), can be converted to comparable units by means of a density index.

c. The analysis of the problems related to criminal justice require spatial "standardization."

d. Example: For example, in a sample of juvenile delinquent males, a different action might be taken if the number of juveniles involved, for example 200, reside in an area of one square mile than if they resided in a hundred square miles. It is also possible that the nature of police operations would depend on the density of target groups (e.g., juveniles or male juveniles).

2. Concentration Index

a. Definition: Concentration indices are most appropriately described as the ratio of two measures relating to the same phenomenon where a particular attribute of the phenomenon is captured in the numerator or denominator but not in both. It is perhaps, the easiest type of index to construct because all the elements come from the same data source.

b. Example: For example, one might need to know about the residence of male juveniles in order to develop a special diversion program for male delinquents in a metropolitan area. With the use of Probation Department files, the index for each census tract can be computed by division of the number of male juveniles against whom delinquency petitions have been filed and whose residence is within that tract by the total number of juveniles residing in that tract against whom such action has been taken.

$$\text{Concentration Index} = \frac{\text{Number of male juveniles in Census Tract 101 having delinquency petitions}}{\text{Total number of juveniles in Census Tract 101}}$$

3. Distribution Indices

a. Definition: A second type of measure, the "distribution index," is useful in assessment of the degree of crime problem within the context of a larger population that could be involved with the problem.

b. The numerator is some aspect of interest to criminal justice such as the number of delinquent males as compared to a "population at risk." The risk population can be persons (e.g., juveniles), places (e.g., liquor stores), or things (e.g., autos).

c. If the analyst is to develop a distribution measure, he/she would not compare male delinquents to all delinquents, male and female. Rather, the denominator of the index is the total number of male juveniles, and the numerator would be the number of delinquent male juveniles in a specified area.

$$\text{Distribution Index} = \frac{\text{Number of delinquent male juveniles}}{\text{Total number of male juveniles}}$$

d. Two data sources may have to be consulted for this index, one from which male juvenile delinquency data can be drawn and one from which male juvenile population counts can be drawn.

e. This kind of measure is often useful for resource allocation and/or long-range planning.

4. Index of Unit Share

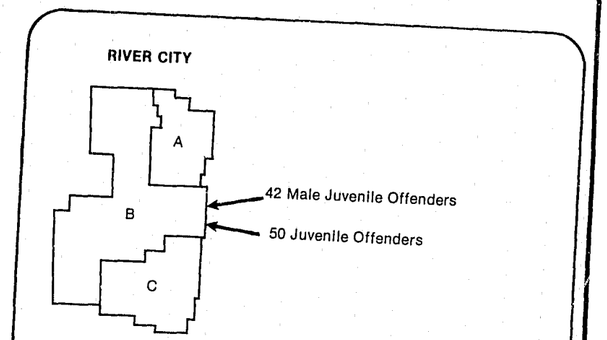
a. Definition: This index refers to the proportion of a phenomenon which occurs in a given area.

$$\text{Index of Unit Share} = \frac{\text{Number of Delinquent Juveniles in Census Tract 101}}{\text{Number of Delinquent Juveniles in Chaos City}}$$

b. These indices are commonly used by criminal justice planners in contrasting the share of crime in an area to that area's share of the population.

c. Example: For example, in the previous discussion the number of male juveniles on probation has been used as the numerator of an index. Suppose that one wants to know which census tract within the total metropolitan area has the greatest share of male juvenile delinquency. This can be calculated by dividing the count of male juveniles who have committed delinquent acts residing in the census tract of interest to the total number of delinquent juveniles for the county.

SHOW V.A. (4-1):



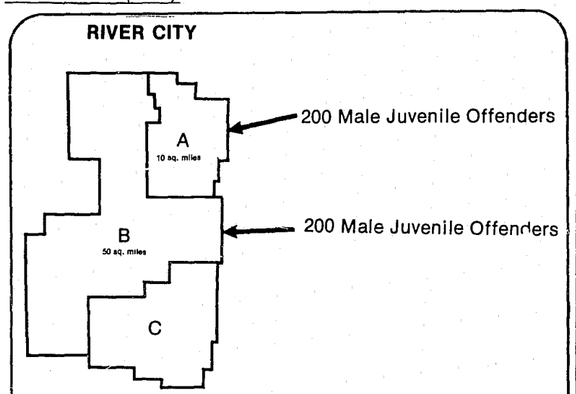
EMPHASIZE (4-1):

+ Ask the group what type of Index is illustrated.

+ It is a concentration index.

+ Answers the question: In Area B, what is the percent of juvenile offenders that are male.

SHOW V.A. (4-2):



EMPHASIZE (4-2):

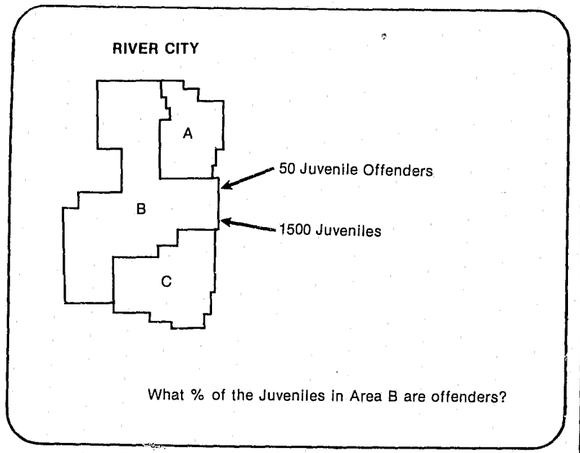
+ Ask the group what type of index is illustrated.

+ It is a Density Index.

+ Answers the question: How can dissimilar areas be compared?

+ A = 20 male juveniles per square mile and B = 4 male juveniles per square mile.

SHOW V.A. (4-3):



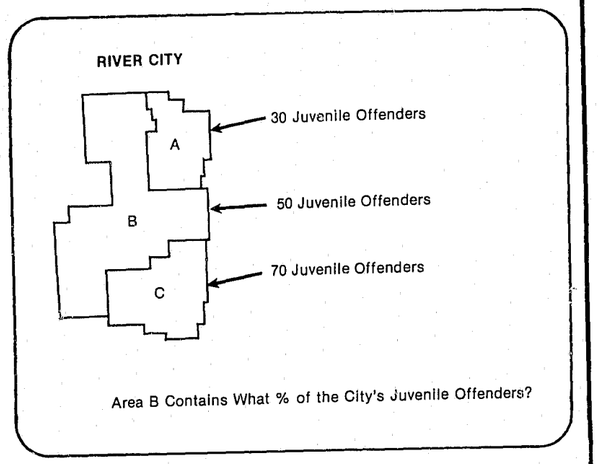
EMPHASIZE (4-3):

+ Ask the group what type of index is illustrated.

+ It is a Distribution Index.

+ Answers the question: What percent of the juveniles in Area B are offenders?

SHOW V.A. (4-4):



EMPHASIZE (4-4):

+ Ask the group what type of index is illustrated.

+ It is an Index of Unit Share.

+ Answers the question: Area B contains what percentage of the City's juvenile offenders?

---

d. Maps displaying the values of each of these index types, through various degrees of shading, provide an excellent visual comparative framework and clearly demonstrate the differences in the meanings of the sample indices regarding juvenile probation statistics. This mode of presentation is excellent for managers and decision-makers whose time constraints preclude their examining extensive statistical tables.

C. Comparative Analysis Using Index Numbers

1. Comparative analysis emphasizes the simultaneous assessment of crime data for many different jurisdictions. It can be done for jurisdictions within a state or for agencies within a metropolitan area. It can be extended by comparisons with crime figures for regional groupings of states or with the nationally aggregated portrait of similar-sized jurisdictions, such as cities 250,000 - 500,000 in population or suburban counties.

2. Data of this sort are provided each year in Crime in the United States. These publications can also be used to obtain data on other jurisdictions and SMSAs which analysts and decision-makers feel are similar to their own. By special request to the FBI, one can often obtain additional crime-specific data (e.g., proportion of crimes involving firearm use) for these juridictions.

3. Comparative analysis is often extended in two directions.

   a. First, victimization data may be introduced. These data allow the analyst to adjust in a rough manner for differences in city-to-city crime reporting. Detailed work with victimization data will also allow the planner to get a richer sense of the typical and not-so-typical characteristics of crime incidents in the local jurisdiction.

   b. Second, comparative measures can be combined with time series data, a very powerful combination which remedies several of the weaknesses of each individual technique.

4. These additions to straight comparative analysis are extremely important; still, much can be gained from comparative work which lacks time, trend or reporting rate perspectives.

INDEX NUMBERS

PURPOSE

To illustrate the use of crime rate data to compare jurisdictions by using a ranking procedure. Review Exhibit 3-1 in the data set. Interpret the table by identifying extreme cities and patterns in the rankings. What are the strengths/weaknesses of this approach?

INSTRUCTOR NOTES

A. Explain the Data Set to the participant. Note ranking for frequency and rates.

B. Interpret Table 1 with participants. Note that the combined ranking is for burglary and larceny. This ranking can then be compared to the Index Crime Ranking.

C. Ask them to consider the strengths and weaknesses of this approach.

DEBRIEFING NOTES

A. The data set contains selected crime data for major cities within a state and gives them explicit ranks on two crime incidence and crime rate dimensions.

B. As an example, this sort of explicit ranking process may be used to determine eligibility for certain "anti-crime offensive" programs, or it may be incorporated into a formula for determining the contours of block grant fund distributions.

C. Statistics like these are particularly useful because significant differences in ranks may be observed over time and these may, in turn, give the analyst important hints about the nature of crime within the state or local jurisdiction which may lead to more successful crime prevention techniques.

D. Purpose of rates and indices is to make data comparable. Area X is more meaningfully compared to area Y and Year 1 to Year 2 with rates and indices -- data expressed as a ratio.

E. Time series comparisons using rates are powerful. For example, with rates it can be observed that not only is City X higher or lower than Y, but whether or not the two are getting closer together or further apart.

Table 1.
SELECTED CRIME DATA FOR CITIES - 25,000 POPULATION AND LARGER

		FREQUENCY		RATE		FREQUENCY RANK		RATE RANK		SUM OF FREQ.	SUM OF RATE	COMBINED FREQUENCY	COMBINED RATE
CITY	POPULATION	BURGLARY	LARCENY	BURGLARY	LARCENY	BURG.	LARC.	BURG.	LARC.	RANKS	RANKS	RANK	RANK
1.	648,412	8,649	16,984	1,335.7	2,624.1	1	1	7	7	2	14	1	6
2.	400,971	8,361	13,625	2,085.2	3,398.0	2	3	2	5	5	7	2	3
3.	394,497	8,011	15,941	2,030.7	4,040.8	3	2	3	3	5	6	2	2
4.	197,452	4,335	8,931	2,195.5	4,523.1	4	4	1	2	8	3	3	1
5.	170,854	1,641	3,380	960.5	1,978.3	7	7	10	8	14	18	5	7
6.	152,479	2,991	6,027	1,961.6	3,952.7	5	5	5	4	10	9	4	4
7.	126,766	1,334	1,859	1,199.1	1,710.2	8	9	8	10	17	18	7	7
8.	107,304	2,126	2,888	1,981.3	2,691.4	6	8	4	6	14	10	5	5
9.	95,325	1,313	4,346	1,377.4	4,559.1	9	6	6	1	15	7	6	3
10.	67,002	636	1,198	1,019.4	1,895.5	10	10	9	9	20	18	8	7

KEY: - Rate equals crime frequency divided by population expressed in 100,000
- Sum of Frequency Ranks equals Rank of Burglary Frequency plus Rank of Larceny Frequency
- Sum of Rate Ranks equals Rank of Burglary Rate plus Rank of Larceny Rank
- Combined Frequency Rank is the reranking of Sum of Frequency Ranks according to magnitude
- Combined Rate Rank is the reranking of Sum of Rate Ranks

SOURCE: United States National Criminal Justice Information and Statistics Service. Sourcebook of Criminal Justice Statistics 1977.

WALK-THROUGH 'F'

NOTES

II. SERIOUSNESS WEIGHTING

A. Need for a Seriousness Scale.

1. Weighting offenses according to seriousness is basically an effort to identify offenses that inflict a greater amount of harm on the community than others. A community's crime problem is linked to the serious offenses; these are what leaders would like to do something about. Therefore, they must be identified. A Seriousness Scale is an attempt to do that.

2. If an accurate measure of seriousness of the crime problem is desired -- analysis of the crime types is not sufficient.

3. Crime types are not sufficient for the following four reasons:

   a. Crime types are nominal level data. Seriousness measures are ordinal level data.

   b. Crime types do not sufficiently provide information which the community can use to determine the level of seriousness.

   c. The UCR program relies on a scoring system in which multiple offenses and, with some types of crime, multiple victims are not recorded. Therefore, a great deal of detail is lost when classifying crime according to UCR rules.

4. A scale is needed that places all offenses on one continuum of seriousness, regardless of crime type -- violent or property.

   a. All the elements of the offense should be considered in a seriousness score.

   b. A ranking method is needed to indicate how much more serious incident X is from Y.

5. Seriousness weights are needed in a seriousness scale.

NOTES

   a. Intuitive values won't work. It is obvious that homicide is more serious than auto theft and auto theft is more serious than loitering. But is robbery of $1,000 more serious than assault resulting in hospitalization or burglary of $250 more serious than auto theft?

   b. It is necessary to know the degree of seriousness. For example, how much more serious is homicide than auto theft.

6. Ranking of seriousness is needed so that fine distinctions can be made. Rankings also need to be uniform so that the distinctions are rational.

7. Need a scale that reflects public sentiment about which crimes are serious and which are not.

B. Sellin-Wolfgang Index.

1. Thorsten Sellin and Marvin E. Wolfgang created a weighting system for crime that can be used to measure changes in the seriousness of crime over time or among jurisdictions.

2. The Sellin-Wolfgang index has three important characteristics:

   a. The index can be disaggregated down to the smallest geographical and temporal unit.

   b. The index is based on data normally collected by local police departments; thus initial costs are minimized. Also, there is likely to exist a sufficiently long series of data for trend analysis.

   c. The index is a measure of the perceived amount of harm inflicted on the community.

3. To develop the index a sample survey was used which asked respondents to describe how serious specific crimes are. These reponses were aggregated to estimate the magnitude of seriousness for specific crimes.

NOTES

4. Scaling techniques were then used to convert responses to scale values for components of a crime as can be seen in Exhibit 2. These values constitute the Sellin-Wolfgang Index.

Exhibit 2.
Sellin-Wolfgang Seriousness
Components and Scores

I.	Number of victims of bodily harm	
	(a) Receiving minor injuries	1
	(b) Treated and discharged	4
	(c) Hospitalized	7
	(d) Killed	26
II.	Number of victims of forcible sexual intercourse	10
	(a) Number of such victims intimidated by weapon	2
III.	Intimidation (except II above)	
	(a) Physical or verbal only	2
	(b) By weapon	4
IV.	Number of premises forcibly entered	1
V.	Number of motor vehicles stolen	2
VI.	Values of property stolen, damaged, or detroyed (in dollars)	
	(a) Under $10	1
	(b) $10 - $250	2
	(c) $251 - $2,000	3
	(d) $2,001 - $9,000	4
	(e) $9,001 - $30,000	5
	(f) $30,001 - $80,000	6
	(g) Over $80,000	10

Source: Sellin, Thorsten, and Marvin E. Wolfgang. The Measurement of Delinquency. New York: Wiley, 1962.

NOTES

5. If a crime is divided into its specific components, each component is given a score, and the scores are totaled and an aggregate estimate of the crime's seriousness is determined.

6. For example, if an offender breaks into an apartment with a weapon, rapes a woman (treated at hospital and discharged), kills the husband and steals their car, in the Sellin-Wolfgang Index the seriousness of the crime is assessed as follows:

```
  1 = apartment entered
 10 = forcible rape
  4 = treated and discharged
  2 = use of weapon
 26 = murder
+ 2 = stolen car
 45 = Total
```

As a second example, consider a juvenile who steals $50 -- a larceny = 2

Both of these examples would equal 1 in the Uniform Crime Reports (UCR).

C. Uses of seriousness scale.

1. Police departments can use the seriousness scale to improve measures of police effectiveness, create strategies to reduce the seriousness of crime, and improve manpower deployment.

2. Prosecutors can use a seriousness scale as a basis for whether an offender is to be prosecuted.

3. Judges can use a seriousness index to aid in making sentencing decisions.

SERIOUSNESS

EXERCISE #2

PURPOSE

Module 4 is intended to expose the participants to the techniques and uses of comparative analysis, particularly as it applies to crime data. This section has focused on a comparison of trends in crime incidence using various rates and indices. In this exercise seriousness is introduced to help elaborate the crime problem. The presentation of three descriptors of crime--time trends, rates and seriousness--are used to indicate that the nature of the crime problem can vary depending on how it is defined and interpreted.

INSTRUCTIONS

The participants are to work with the following assault data to compare trends in incidence, rate per 100,000 population, and seriousness.

Following are the specific tasks to be performed:

1. Calculate the raw seriousness of assaults for each year.

2. Transform that figure into "seriousness per incident" so that the annual indices are then comparable.

3. Calculate the percent change in seriousness/incident for the years 1970-1974.

4. Compare it to percent change in incident and rate.

5. Describe trends in assault between 1970 and 1974 using these three descriptors.

INSTRUCTOR NOTES

A. Explain to the participants that they are to compare the change in incidence, rate and seriousness.

B. To do that, they will have to (a) calculate the raw seriousness of assaults for each year in the data set, (b) transform that figure into seriousness per incident to be able to compare the annual indices, (c) calculate the percent of change in seriousness/incident for each year and (d) compare it to percent change in incidence and rate.

C. Exercise Schedule

Briefing	(5 min.)
Participant Activities	(30 min.)
Debriefing	(10 min.)

DEBRIEFING NOTES

A. Go over each of the calculations, emphasizing those points with which participants had difficulties as observed by you and the facilitators.

B. Discuss the observed trends in assault with the participants.

DATA SET

Table 1. Assaults, Chaos City, 1973-1977

	1973	1974	1975	1976	1977	% Change 1973-77
Assault Incidence	1015	1251	1424	1410	1331	31%
Rate*	363.9	446.2	469.0	427.9	390.3	7%

Source: Chaos City Police Department, 1978.
*Per 100,000 Population.

Participants should assume that, according to a modified seriousness index, assault is broken down into the following categories and assigned the following weights:

Receiving Minor Injuries	-	Multiply by 1
Treated and Discharged	-	Multiply by 4
Hospitalized	-	Multiply by 7

The assault data are distributed among these four categories as follows:

Table 2. Assaults by Seriousness Categories
Chaos City, 1973-1977

	1973	1974	1975	1976	1977
Victim Received Minor Injuries	338	376	236	109	146
Victim Treated and Discharged	508	612	756	797	730
Victim Hospitalized	169	263	432	504	455

Source: Chaos City Police Department, 1978.

WORKSHEET

1. Develop matrix and calculate values.

	1973		1974		1975		1976		1977	
	#	SS*	#	SS*	#	SS*	#	SS*	#	SS*
Victim Received Minor Injury	338	338	376	376	236	236	109	109	146	146
Victim Treated And Discharged	508	2032	612	2448	756	3024	797	3188	730	2920
Victim Hospitalized	169	1183	263	1841	432	3024	504	3528	455	3185
Σ	1015	3553	1251	4665	1424	2684	1410	6825	1331	6251

EXERCISE #2

2. Calculate seriousness per incident:

Seriousness per Incident	1973	1974	1975	1976	1977
	3.50	3.73	4.41	4.84	4.70

3. Calculate % change in seriousness per incident: 1973-1977

$$\% \text{ change} = \frac{4.70 - 3.50}{3.50} \times 100$$

% change = 34%

4. Compare change in incident and rate to change in seriousness:

31% incident
7% rate
34% seriousness per incident

NOTES

III. CROSS CLASSIFICATION TABLES.

A. Purpose is to move away from the description of one variable to an examination of the relationship between two variables -- bivariate descriptions.

1. Variables should be organized into hypotheses containing a dependent and an independent variable as discussed in Module 1.

2. Cross classification or cross tabulation is used to describe the relationship between an independent variable and a dependent variable for nominal or ordinal level measures.

B. Illustration of a one-way and two-way cross classification table (Exhibit 2).

1. The one-way table shows in both absolute and relative terms the preponderance of larceny-theft among all crimes in the total U.S. crime index; larceny-theft accounted for nearly 6 million out of 11.25 million crimes, i.e., over 53.1% of all crimes. The next highest category, burglary, represents not quite 33% of the crimes in the index. All of the other categories account for the remaining 18% of crimes.

2. When the dimensions of "place of occurrence" are added, it is evident that there is a radical difference in the number of crimes, regardless of category, that occur in SMSA's on the one hand and in other cities and rural areas on the other. This is reasonable since there are much greater numbers of people in absolute terms in SMSA's. However, continued examination of the two-way variable reveals some interesting breakdowns outside of SMSA's which would indicate that more than sheer population density must be at work in many cases. For example, the same number of burglaries take place in other cities as in rural areas, and considerably more murders and forcible rapes take place in rural areas.

Exhibit 1. One and Two-Way Table Illustrations

One-Way Table Illustration

	Category							
	1	2	3	4	5	6	7	8
	Total U. S. Crime Index	Murder and Non-Negligent Manslaughter	Forcible Rape	Robbery	Aggravated Assault	Burglary	Larceny-Theft	Motor Vehicle Theft
Total Number	11,256,616	20,505	56,093	464,973	484,713	3,252,129	5,977,748	1,000,455
Percent of Total	100%	.2%	.5%	4.1%	4.3%	28.9%	53.1%	8.9%

Two-Way Table Illustration
(Totals from above)

Type of Crime	SMSA'S	%	Other Cities	%	Rural	%
Murder & Non-Negligent Manslaughter	16,490	.2	1,313	.1	2,702	.4
Forcible Rape	48,894	.5	3,196	.3	4,003	.6
Robbery	443,461	4.6	13,685	1.3	7,827	1.2
Aggravated Assault	397,998	4.2	45,523	4.3	41,192	6.2
Burglary	2,729,061	28.6	261,276	24.9	261,792	39.3
Larceny/Theft	4,989,336	52.3	674,718	64.2	313,694	47.1
Motor Vehicle Theft	915,297	9.6	51,038	4.9	34,120	5.1
	9,540,537		1,050,749		665,330	

NOTES

C. Percentaging a Cross Classification

1. If we want to know whether two variables in a hypothesis are related, are associated, or if they are independent of one another, percentaging a cross classification is a useful first step.

2. If the variables are independent, then knowledge of the independent variable does not help us understand or predict the dependent variable.

3. Cross classification is not concerned with <u>strength</u> or significance of association (covered in Module 5)

4. Percentaging a cross classification is the division of the observations according to the independent variable.

CROSS CLASSIFICATION TABLES

PURPOSE

Walk-Through 'G' illustrates the use of a four-step procedure for interpretation of cross classifications. This Walk-Through also provides an opportunity for discussing causality in regard to recidivism. It demonstrates how percentages enhance the ability to understand the tables.

Go through the four-step procedure using the recidivism data provided. Interpret the table using percentages.

INSTRUCTOR NOTES

A. Explain the four-steps in interpretation of cross-classification.

Describe each of the four steps.

1. Identify independent (columns) and dependent variables (rows) and distribute raw data into appropriate cells.
2. Percentage the dependent variable.
3. Percentage the dependent variable for one of the independent categories.
4. Percentage the dependent variable for each of the remaining independent categories.

B. Interpret the data set. Interpretation should include the following:

1. Sixty percent of unemployed ex-offenders are recidivists; not 60% of recidivists are unemployed. This is why independent is set up as column variable.
2. There appears to be an association between the independent and dependent variable.
3. Indicate use of row, column and total percentages.
   a. Row - 80% of the recidivists are unemployed.
   b. Column - about 86% of those employed did not recidivate.
   c. Total - 20% of the total were unemployed and recidivists.

DATA SET (See Tables 1 and 2.)

WORKSHEET (Not Applicable)

Table 1. Four Step Interpretation of Cross-Tabulations

Step 1: Identify independent and dependent variables.

Relationship of Employment Status and Recidivism Status

(Dependent Variable)	(Independent Variable)		
Recidivism Status	Employment Status of Ex-Offenders Unemployed	Employed	Total
Recidivist	30	10	40
Non-Recidivist	20	60	80
Total	50	70	120

Source: Paradise University, Criminal Justice Research Center, 1978.

Step 2: Percentage the dependent variable.

Recidivism Status	Employment Status of Ex-Offenders Unemployed %	Employed %	Total %
Recidivist			33.3
Non-Recidivist			66.7
Total			100.0

Table 2. Four Step Interpretation of Cross Tabulations (Continued)

Step 3: Percentage the dependent variable for one of the independent categories.

Recidivism Status	Employment Status of Ex-Offenders Unemployed %	Employed	Total %
Recidivist	60.0		33.3
Non-Recidivist	40.0		67.7
Total	100.0		100.0

Step 4: Percentage the dependent variable for the other independent categories.

Recidivism Status	Employment Status of Ex-Offenders Unemployed %	Employed %	Total %
Recidivist	60.0	14.0	33.3
Non-Recidivist	40.0	86.0	67.7
Total	100.0	100.0	100.0

IV. SCATTERGRAMS

A. Definition:

1. A scattergram is a graphical presentation of interval level data.

2. It is a method used to examine the relationship between a pair of variables and to describe patterns in quantitative data.

B. Construction and Interpretation of Scattergrams.

SCATTERGRAM

PURPOSE

This Walk-Through illustrates how to construct and interpret a scattergram. Examine Table 1 in the data set for general trends, clustering, and outliers. Interpret the scattergram. Repeat this procedure on Table 2.

INSTRUCTOR NOTES

A. Tell the participants to follow Table 1 as you explain the process of plotting the data and constructing a scattergram.

B. Interpret the Tables.

1. Table 1 presents data on two variables for each of the ten cities in the hypothetical State of Paradise. Each city has been measured for population density and crime level.

2. It seems plausible that the higher an area's population density the more crime there is likely to be.

3. The data help to verify the hypothesized relationship.

4. The scattergram in Table 1 has the following features:

   a. Each community has been plotted as a single dot.

   b. The horizontal and vertical axes have been proportionately scaled and properly and fully labeled.

   c. Title and data source statements are completed.

5. Interpretation of scattergrams usually consists of three types of approaches to the data.

   a. The first emphasizes the overall relationship exhibited by the data. In Table 1 a strong positive linear relationship is visible.

   b. A second approach to interpreting scattergrams involves examining the tendency of the dots to cluster. In Table 2 ten SMSA's have been plotted based on two attributes: total index crime per 100,000 population and police per 100,000 population. These ten SMSA's are the highest and lowest in the U.S. relative to the total crime index in 1975. SMSA's with low crime rates tend to have low police per capita rates, while those with high crime rates tend to have higher police per capita rates.

   Similarly, in Table 1, note the two major clusters of cities--A, F, G, and H and B, D, E and J. Further analyses of these two tables can focus on identifying possible explanations for the clusters as well as on developing descriptive labels for each cluster that captures what it is that the cluster represents.

   c. A final approach to interpreting scattergrams emphasizes so-called outliers. These are extreme values. In Table 2 Las Vegas is such an outlier. An interpretation can be enhanced if the reasons for such extreme values can be understood or speculated about.

C. This Walk-Through should not last longer than ten minutes.

WALK-THROUGH 'H'

Table 1.

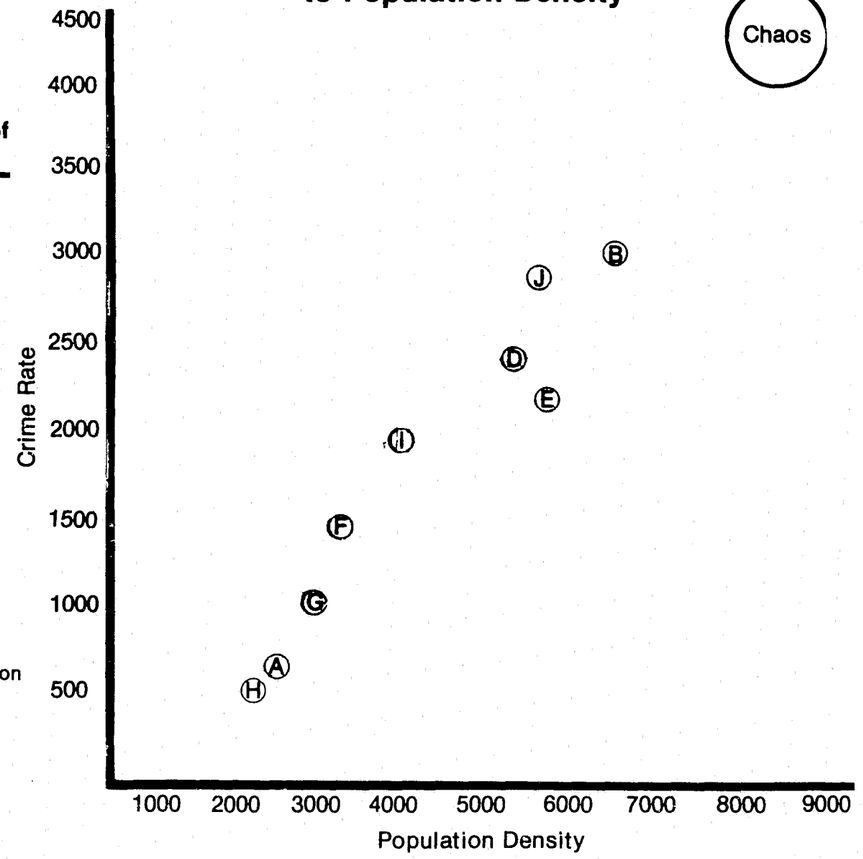
Crime Rate Related to Population Density

Cities	Population Density*	Incidence of Crime**
A	800	2500
B	3100	6200
Chaos	4500	9140
D	2600	5200
E	2300	5500
F	1500	2900
G	1300	2700
H	750	2200
I	2000	3800
J	3000	5500

* Total Population / Area (in sq. miles)

** Total Crime Index per 100,000 Population

Source: Hypothetical Data



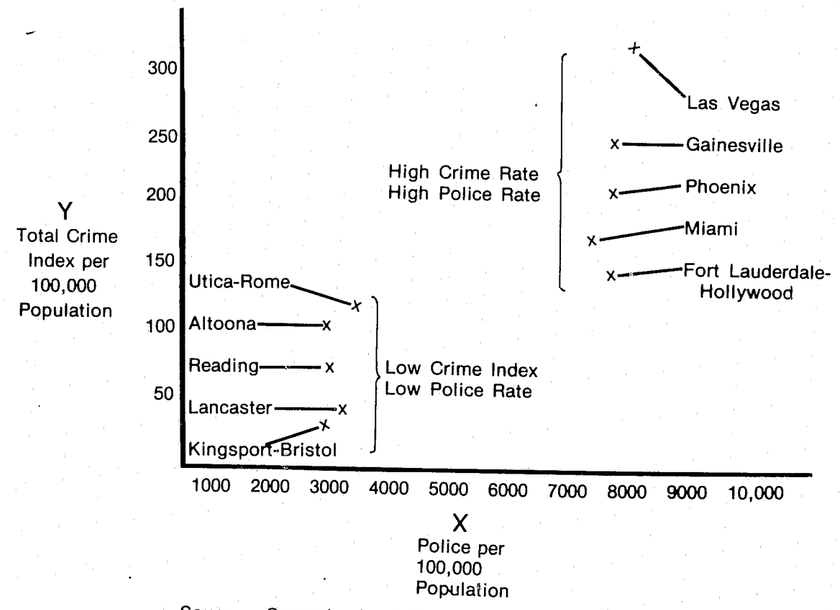
WALK-THROUGH 'H'

DATA SET

Table 2.

Total Crime Index Related to Police Strength

Low SMSA's	Y Crime Index	Officers	X Officers/ 100,000 Pop.	Pop.
Altoona, Pa	2112	113	82.7	136,638
Kingsport-Bristol,Tenn.	2159	88	34.7	253,721
Lancaster, Pa.	2244	128	38.8	329,545
Reading, Pa.	2167	194	64	303,110
Utica-Rome, N.Y.	2192	278	85.3	325,732
High SMSA's				
Phoenix, Ar.	9795	1901	162.0	173.300
Miami, Fla.	9130	1621	117.0	1,385,889
Las Vegas, Nev.	9318	934	300.2	311,153
Gainesville, Fla.	9328	209	170.3	122,751
Fort Lauderdale-Hollywood Fla.	9252	883	108.7	812,221



Source: Sourcebook, 1976

WALK-THROUGH 'H'

EXERCISE #3

SCATTERGRAM

PURPOSE

To give the participants an opportunity to practice preparing and interpreting a scattergram.

INSTRUCTIONS

A. Examine the data in Table 1. Two variables are presented--population per square mile, the independent variable, and reported larceny offenses, the dependent variable. Note that the units of analysis are Florida counties.

B. What would you hypothesize is the relationship between these two variables, if any?

C. Construct a fully labeled and accurate scattergram using the data in Table 1.

D. Interpret the scattergram.

INSTRUCTOR NOTES

A. Explain the purpose of the exercise and the nature of the data in Table 1.

B. Have them prepare a scattergram of the data. Be sure that they are aware "reported larcenies" is the dependent variable, and that the dependent variable is always plotted on the vertical axis.

C. Distribute graph paper (preferably three hole punched so it can be inserted into their Guide) and rulers.

D. The schedule for this exercise provides:

Briefing	5 minutes
Activities	20 minutes
Debriefing	5 minutes

EXERCISE #3

DATA SET

Table 1. Reported Larceny by Population Density
Thirteen Florida Counties, 1977

COUNTY	POPULATION PER SQ. MILE 7-1-77	REPORTED LARCENY OFFENSES
1. Alachua	146	5,740
2. Duval	748	21,645
3. Hillsborough	581	25,040
4. Orange	467	17,920
5. Polk	151	10,750
6. Leon	202	5,495
7. Volusia	206	11,700
8. Seminole	466	2,930
9. Escambia	345	10,215
10. Sarasota	291	5,840
11. Brevard	252	9,085
12. Lee	220	4,775
13. Palm Beach	250	20,830

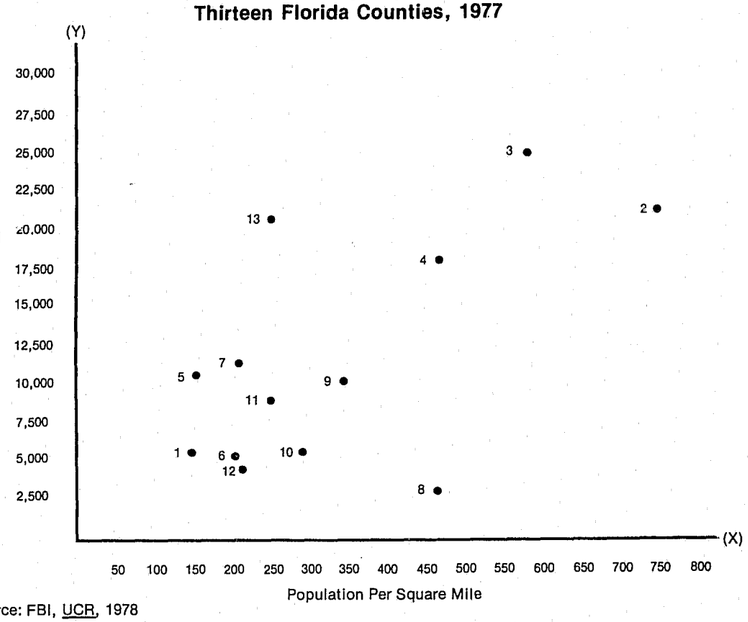
Source: FBI, UCR, 1978

EXERCISE #3

WORKSHEET

SHOW ANSWER:

Reported Larceny by Population Density, Thirteen Florida Counties, 1977



Source: FBI, UCR, 1978

EXERCISE #3

DEBRIEFING NOTES

A. Go over completed scattergram and its interpretation.

B. Have participants compare their scattergram to the visual aid and clear up any mistakes or misinterpretations.

C. Note lack of linear patterns.

D. Point out that cluster at bottom left and the outliers are of interest, particularly Palm Beach (13) and Seminole (8) counties.

E. Make sure they are aware of the relationship between this activity and "problem specification" as discussed in Module 1. That is, the state legislature may have been concerned about the impact of population growth in the state. State analysts focused that concern on a number of related concepts and hypotheses. This illustrates their interpretation for one specific hypothesis. Interpretation, as usual here, means the conversion of measures (data) into understandable and useful information.

F. Also, indicate that a scattergram should build upon descriptive statistics for the variable being interpreted. In this example,

$\bar{X}$ Population Density = 332.7
S Population Density = 182.3
$\bar{X}$ Larceny = 11689.6
S Larceny = 7314.8

G. Indicate that this data will also be used in Module 5 for calculating a correlation coefficient.

EXERCISE #3

NOTES

V. Statistical Maps

A. Importance of Statistical Maps

1. Spatial analysis is important in criminal justice planning because it fits many of the operational problems, such as deployment of police, jury selection in courts and isolation of crime and/or victimization and related social problems.

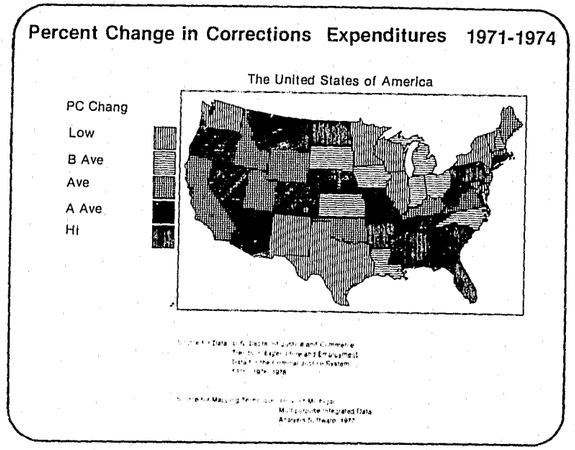
2. Furthermore, program funding is rarely applied to individuals. Rather, funds are applied to problem areas, such as neighborhoods and communities. Therefore, it is important for the analyst to be able to utilize tools that provide ways of aggregating individual cases or transacting statistics into spatial summaries that can be used to display and interpret data.

B. Principals in Map Making

1. A small number of categories and shades to facilitate reading of the map.

2. Select appropriate geographical units to present.

SHOW V.A. (4-5):



EMPHASIZE (4-5):

+ That shading for different classifications must be appropriate.

+ That scaling and shading are of critical importance.

+ In this example the following scale was used to highlight extremes (note uneven category sizes:

  High = 72% + (Maximum is 172.6%)
  High Average = 51 to 71%
  Average = 43 to 50%
  Low Average = 31 to 42%
  Low = 30% (Minimum is -12.5%)

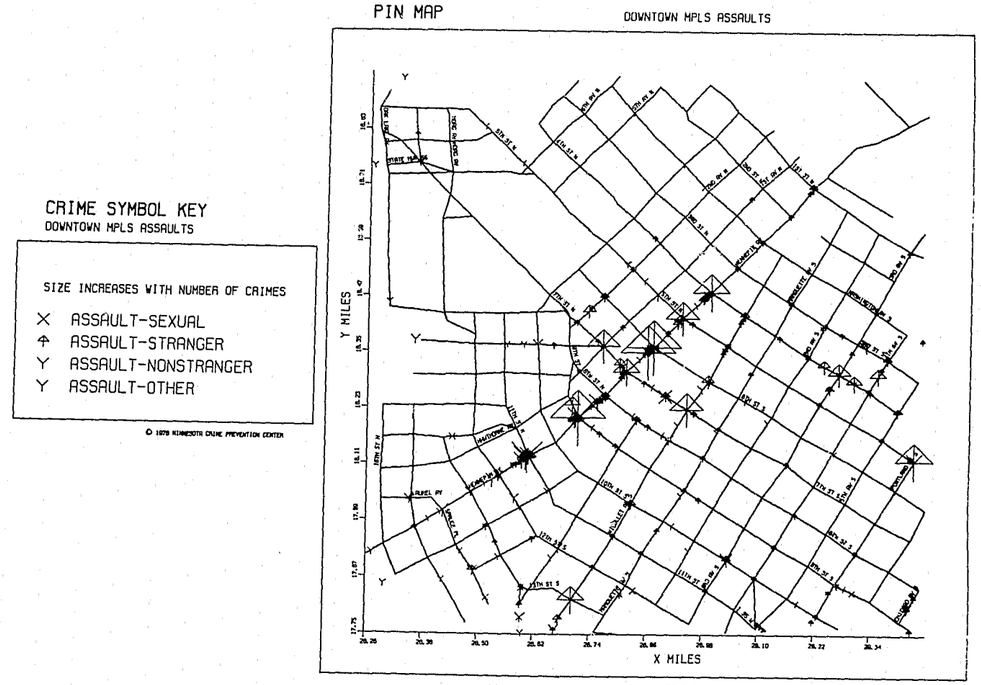
+ In this example, as indicated in the margin, darker shades indicate a higher percent change in expenditures.

NOTES

C. Spatial characteristics of crime

Following is a series of four computer-drawn maps of downtown Minneapolis. Presented are four related but distinct perspectives on the assault problem in the downtown area.

SHOW V.A. (4-6):



Used by permission: © 1978 Minnesota Crime Prevention Center
2344 Nicollet Avenue, Minneapolis, Minnesota 55404, (612) 870-0780

EMPHASIZE (4-6):

+ Map of downtown Minneapolis indicating the geographic pattern of four types of assaults in the Central Business District.

+ Symbols are larger for areas with higher frequencies.

+ Each type of assault has a different symbol.

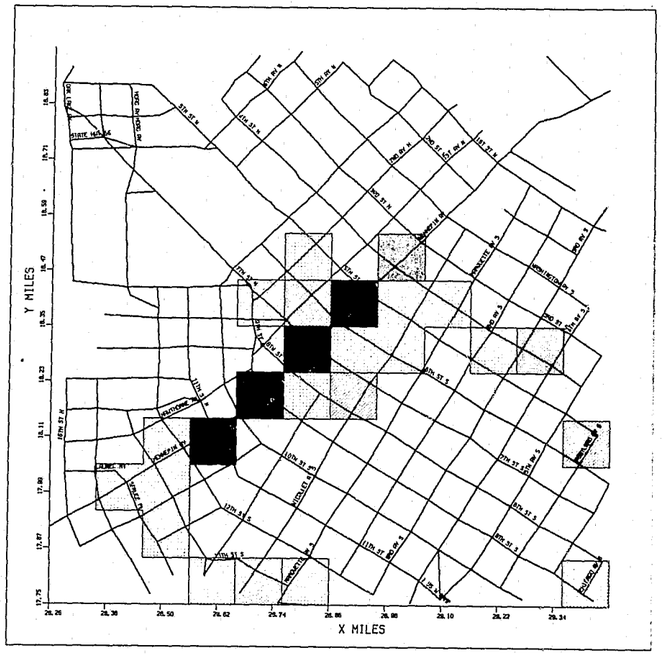
SHOW V.A. (4-7):

GRID KEY
DOWNTOWN MPLS ASSAULTS

GRID SIZE .0100 SQ MILES
EQUAL INTERVAL

0.0 TO	5.0
5.1 TO	10.1
10.2 TO	15.2
15.3 TO	20.3
20.4 TO	25.4
25.5 TO	30.4
30.5 TO	35.5
35.6 TO	40.6
40.7 TO	45.7
45.8 TO	50.8
50.9 TO	55.9

GRID MAP DOWNTOWN MPLS ASSAULTS



EMPHASIZE (4-7):

+ Mapping of assaults in downtown Minneapolis using same data as in V.A. (4-7).

+ Shading used to indicate the relative intensity of assaults in a specified area.

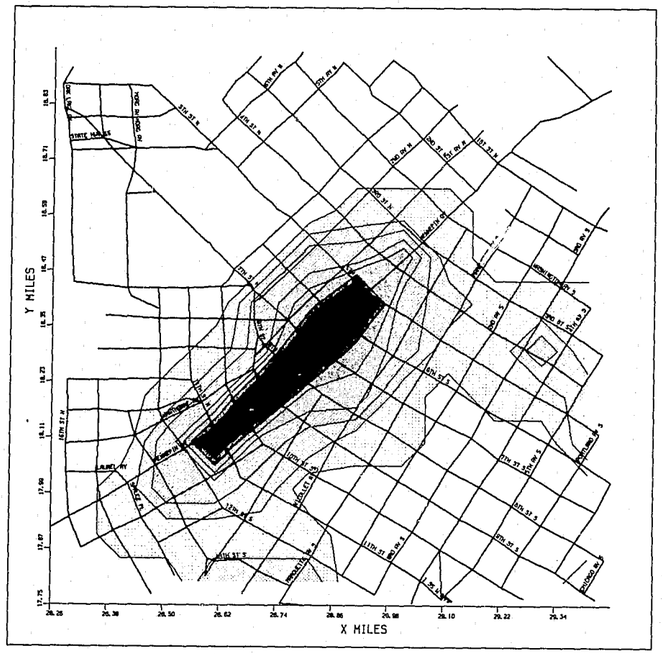
SHOW V.A. (4-8):

SMOOTHED CONTOUR KEY
DOWNTOWN MPLS ASSAULTS

GRID SIZE .0100 SQ MILES
EQUAL INTERVAL

0.0 TO	2.7
2.8 TO	5.5
5.6 TO	8.3
8.4 TO	11.1
11.2 TO	13.8
13.9 TO	16.6
16.7 TO	19.4
19.5 TO	22.2
22.3 TO	25.0
25.1 TO	27.8
27.9 TO	30.6

SMOOTHED CONTOUR MAP DOWNTOWN MPLS ASSAULTS

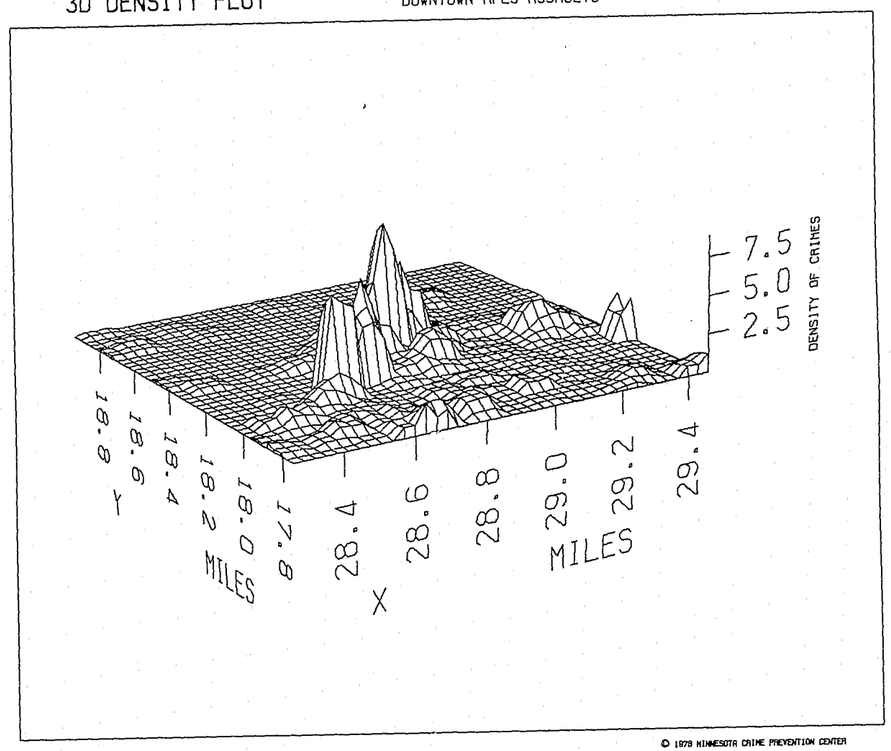


EMPHASIZE (4-8):

+ Contour intervals used to display same assault data as in previous maps.

+ Clearly indicates "corridor" characteristic to the assault problem.

SHOW V.A. (4-9):



EMPHASIZE (4-9):

+ Three dimensional contour map of assault densities in downtown Minneapolis.

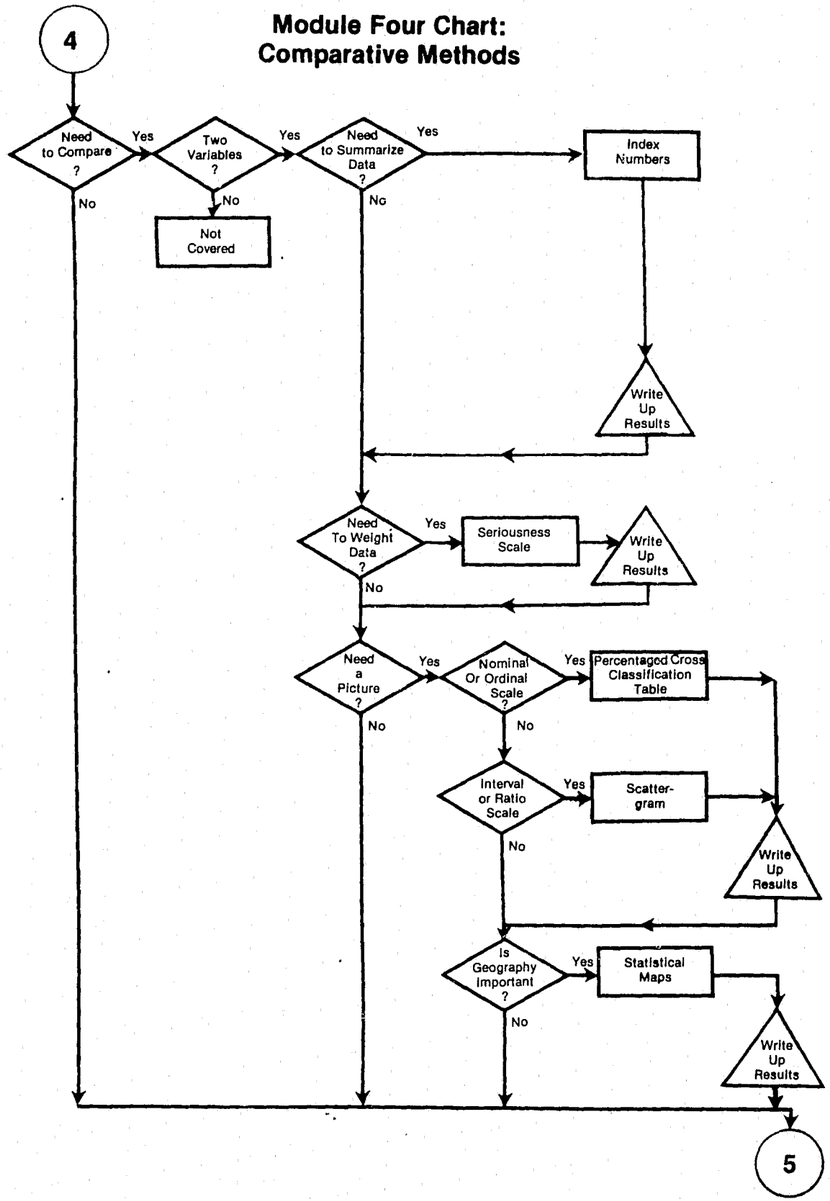
+ Peaks indicate "hot spots" -- highest peak on this map is the location of Moby Dick's Bar in downtown Minneapolis.

NOTES

VI. CONCLUSION

Refer to module chart. Indicate while comparative methods describe and suggest relationships, other tools are necessary to make inferences about relationships. Some of these methods are covered in Module 5.

V.A. (4-10):


4
Module Four Chart:
Comparative Methods
Need to Compare ?
Yes
No
Two Variables ?
Yes
No
Not Covered
Need to Summarize Data ?
Yes
No
Index Numbers
Write Up Results
Need To Weighi Data ?
Yes
No
Seriousness Scale
Write Up Results
Need a Picture ?
Yes
No
Nominal Or Ordinal Scale ?
Yes
No
Percentaged Cross Classification Table
Interval or Ratio Scale
Yes
No
Scatter-gram
Write Up Results
Is Geography Important ?
Yes
No
Statistical Maps
Write Up Results
5

MODULE 5
INFERENTIAL METHODS

Module 5 presents material covering two complex and difficult areas of statistics: inference and prediction. In covering this material the emphasis should be on: 1) when a particular procedure is appropriate; 2) rules to follow and the assumptions made in using a procedure; 3) practical applications of the method, and 4) how the resulting information is interpreted. The specific procedures covered include: chi square, correlation, and least squares regression.

OBJECTIVES - MODULE 5
INFERENTIAL METHODS

1. Explain the purpose and outline the general process of statistical testing.

2. Define, select, calculate and interpret the following measures of association:

   a. Chi square statistic

   b. Correlation coefficient

3. Define, select, calculate and interpret the following methods of prediction:

   a. Visual estimation

   b. Least squares regression

SCHEDULE

INFERENTIAL METHODS

TIME ALLOCATION

* Less than 5 minutes

NOTES

I. STATISTICAL TESTING

A. Definition:

1. In Modules 3 and 4 we distinguished between two primary purposes of statistics: description and inference.

   a. Description involves summarizing masses of data to facilitate communication.

   b. Inference involves summarizing also, but goes beyond description enabling us to make generalizations based on incomplete information.

2. Two basic areas of inference are: questions of difference and questions of association.

   a. Questions of difference involve comparing one group to another to determine if they are dissimilar. For example, are urban female senior citizens more prone to predatory crime than the general population?

   b. Questions of association involve examining the relationships between variables. For example, is family income and delinquency somehow related? If so, how are these variables related? A second example is, does the length of incarceration increase as the seriousness of the offense increases?

3. Samples and Inference

   a. A primary reason for inferential statistics is our dependency on samples rather than on a census; incomplete information rather than complete information.

   b. There are two issues when using a sample:

      (1) Is our result "true?" i.e., would they be the same if we could measure the entire population?

NOTES

(2.) How confident are we in our findings?

c. Generally, as sample size decreases, the importance of statistical inference increases.

B. Statistical Tests

1. Step by step procedure is used for organization and interpretation of various inferential statistics.

2. The procedure is as follows:

SHOW V.A. (5-1)

STATISTICAL TEST PROCESS

1. State Null Hypothesis
2. State an Alternative Hypothesis
3. Select Statistical Test
4. Determine Level of Significance
5. Calculate Test Statistic
6. Compare Test Statistic To Table Values
7. Interpret Findings

NOTES

EMPHASIZE (5-1):

+ Step One: State a null hypothesis.

  - A null hypothesis is a mathematical statement that suggests there is no relationship between the variables being studied.

  - For example,"There is no relationship between the location where a person lives in Chaos City and his or her attitude toward the police."

+ Step Two: State an alternative hypothesis.

  - An alternative hypothesis is simply the affirmative statement of the null hypothesis. For example, "There is a relationship between where a person lives in the Chaos City and his or her attitude toward the police."

+ Step Three: Select the appropriate statistical test.

  - A statistical test is a means for determination of the statistical significance of the association between two variables.

  - It is a test in that a calculated statistic (from the data) is compared to a predicted value of the statistic (obtained from tables of such statistics).

  - What is being tested is whether the measured association could reasonably be attributed to chance.

+ Step Four: Determine the level of significance to be applied to the problem.

  - The level of significance is interpreted as the probability of an association having resulted from sampling error.

  - That is, if the level of significance is set at .05, this would indicate the probability of the observed association having resulted from chance, i.e., only 5 in 100. This means that if the population of people were sampled 100 times, only 5 times would we expect these results by chance.

NOTES

+ Step Five: Calculate the test statistic.

+ Step Six: Compare the test statistic to table value.

+ Step Seven: Interpret the finding(s) of the test.

---

3. Problems in utilizing such tests result from the improper statement of the null hypothesis, a misunderstanding of the underlying assumptions of such tests, and the misinterpretation of the findings.

4. Perhaps the greatest danger in applying measures of association is what is referred to as a "spurious" correlation. A relationship is spurious when either there are illegitimate inferences of causation or when two variables are related only by a third.

5. Example: An example of an intervening variable problem is the relationship between population density and the crime rate. One model implied here is that higher density causes a higher crime rate. This implied relationship apparently has some merit. However, population density does not directly cause crimes to occur. Instead, there must be some intervening factors, such as reduced police visibility, which result in the higher crime rates; higher density results in less police visibility which causes a higher crime rate. Perhaps the most parsimonious model would suggest that higher population density reduces police visibility which increases the opportunity for an individual to commit crime. It's parsimonious because the most direct explanation is that people cause crime.

6. The point of this example is that the existence of a correlation does not prove any causal connection.

NOTES

II. CHI SQUARE TEST OF INDEPENDENCE

A. Uses

1. This test indicates the degree of independence of two classifications.

2. It tests a null hypothesis of independent classifications.

3. It helps interpret cross classification tables.

B. Characteristics

SHOW V.A. (5-2):

CHI SQUARE GENERAL CALCULATION FORMULA

$$(1)\quad X^2 = \sum \frac{(O - E)^2}{E}$$

Where: E = An expected cell frequency
O = An observed cell frequency
Σ = Means sum for all cells in the table.

$$(2)\quad E = \frac{RT(CT)}{T}$$

Where: RT = Observed Row Total
CT = Observed Column Total
T = Total Observed Frequencies

EMPHASIZE (5-2):

+ Used with categorical data.

+ Does not indicate the presence or absence of intervening factors.

+ Does not preclude a spurious relationship.

+ Information above the nominal level may be hidden.

+ Must have an expected frequency of at least five in each cell.

+ Requires a large sample size, but if it is too large, Chi Square is not very discriminating.

+ Assumes outcomes are independent and that each sample observation can fall in only one category.

SHOW V.A.(5-3):

DEGREES OF FREEDOM

Degrees of Freedom are determined by multiplying the number of rows minus one times the number of columns minus one.

(Rows - 1) (Columns -1) = Degrees of Freedom

√ = freely specified	√	√	√	√	√	0	RT1
O = Not freely specified	0	0	0	0	0	0	RT2
	CT1	CT2	CT3	CT4	CT5	CT6	

2 x 6

(2 — 1) (6 — 1) = 5 Degrees of Freedom

EMPHASIZE (5-3):

+ Degrees of freedom are the number of values that can be chosen freely.

+ Given RT_1, RT_2, CT_1, CT_6, only the checked cells can be freely specified, the others must take on specified values.

+ Use of a Chi Square Table requires knowledge of the degrees of freedom.

SHOW V.A. (5-4):

VALUES OF CHI SQUARE (X^2) AT THE 5% AND 1% LEVELS OF SIGNIFICANCE

DEGREES OF FREEDOM	5%	1%
1	3.84	6.63
2	5.99	9.21
3	7.81	11.34
4	9.49	13.28
5	11.07	15.09
6		
Etc.		

Source: Robert Parsons, Statistical Analysis: A Decision-Making Approach. (N.Y.: Harper and Row, 1974) p. 824.

EMPHASIZE (5-4):

+ Significance level is used to select the probability value.

+ Table presents some representative Chi Square values.

+ No single standard for selecting a level of significance to test a hypothesis exists.

WALK-THROUGH "I"

CHI SQUARE

PURPOSE

This problem examines the association between responses to a survey question, "Would you say, in general, that your local police are doing a good job or a poor job?" and the race of the respondent using a cross classification table and the Chi Square test of independence.

Perform each of the following steps:

1. State the null hypotheses, H_o: Response is independent of race.
2. State the alternative hypotheses, H_a: Response and race are dependent.
3. Calculate expected values, substitute in formula.
4. Establish rejection region at .05. Calculate degrees of freedom.
5. What are your conclusions about H_o and H_a?

INSTRUCTOR NOTES

A. Tell participants to follow their work sheets as you explain the procedures and calculations.

B. Be sure to cover the following:

1. Requires categorical data.
2. Determination of level of significance is important.
3. Does not indicate the presence or absence of intervening factors.
4. Does not preclude a spurious relationship.
5. Must have an expected frequency of at least 5 in each cell.
6. Requires a large sample size, but if it is too large, x^2 is not very discriminating.
7. Assumes outcomes are independent and that each sample observation can fall in only one category.

C. State your conclusions based on the tested relationship.

D. Walk-Through should last no more than 15 minutes.

WALK-THROUGH "I"

DATA SET

Table 1. Race of Respondent

Regard for Police	White	Black	Totals
High	80	25	105
Low	45	50	95
Totals	125	75	200

Source: Paradise University, Criminal Justice Research Center, 1978.

WORKSHEET

A. State Null Hypothesis:

H_o: response independent of race

H_a: response and race are dependent

B. Calculate Expected Values:

$$E_1 = \frac{105\ (125)}{200} = 65.63$$

$$E_2 = \frac{105\ (75)}{200} = 39.38$$

$$E_3 = \frac{95\ (125)}{200} = 59.38$$

$$E_4 = \frac{95\ (75)}{200} = 35.63$$

WALK-THROUGH "I"

WORKSHEET (Continued)

C. Develop Worksheet and Calculate Values:

Cell	Observed (O)	Expected (E)	O-E	$(O-E)^2$	$(O-E)^2/E$
1	80	65.63	14.37	206.50	3.15
2	25	39.38	-14.38	206.78	5.25
3	45	59.38	-14.38	206.78	3.48
4	50	35.63	14.37	206.50	5.80

D. $\Sigma((O-E)^2/E) = x^2 = 17.68$

E. Determine Degrees of Freedom = (r-1)(c-1) = 1
Establish Rejection Region at .05

F. Compare calculated and Table x^2; interpret result.

Table x^2 = 3.84

Calculated x^2 = 17.68

WALK-THROUGH 'I'

CHI SQUARE

PURPOSE

To give participants an opportunity to calculate and interpret a Chi Square statistic.

INSTRUCTIONS

You are to perform an analysis and interpretation of the results of a survey of the State of Paradise residents using a Chi Square Test of Independence. Include the following:

A. Evaluate the null hypothesis that burglary crime trends are independent of the type of area.

B. State the null and the alternative hypotheses.

C. Determine the number of degrees of freedom for each table.

D. Decide on a level of significance.

E. Calculate the x^2 statistics.

F. State your decision about H_o and H_a, based on the x^2 test.

G. Write one or two sentences describing the results of your test on these data.

INSTRUCTOR NOTES

A. Tell the participants to analyze the result of a survey of State of Paradise residents using a Chi Square Test of Independence. Tell them to perform the exercise following the steps outlined in the Worksheet.

B. Depending on time available, have participants work on either Part I or Part II of the problem; Part II has a 3 X 3 Table while Part I is a 2 X 3 Table.

C. The Exercise is to be done at the tables in groups.

D. Schedule

1. Preparation 5 minutes
2. Activities 30 minutes
3. Debriefing 10 minutes

EXERCISE #4

DEBRIEFING NOTES

A. Show the participants the correct answers for each item, spending more time on those which you and the facilitators identified as problems.

B. Have each group report how it described the results and comment upon the reports.

C. Point out that the Chi Square test is a method to be used along with percentaging a cross classification table.

EXERCISE #4

DATA SET

Table 1. State Of Paradise
Burglary Crime Trends, by area, 1976 & 1977

AREA	1976	1977	Totals
Urban	2015	2563	4578
Suburban	819	710	1529
Rural	1050	805	1855
Totals	3884	4078	7962

Source: FBI, UCR, 1978

Table 2. State of Paradise
Victimization Survey Results, Burglary, 1977

How important is burglary as a problem?	Urban	Suburban	Rural	Totals
Very Important	356	52	28	436
Important	90	31	158	279
Not Important	52	50	62	164
Totals	498	133	248	879

Source: Paradise University, Survey Research Center, 1978.

EXERCISE #4

WORKSHEET

A. Part One:

1. State Null Hypotheses

H_o: crime trend is independent of area

H_a: they are dependent

2. Calculate Expected Values:

$E_1 = \frac{4578\ (3884)}{7962} = 2233.23$ $\quad E_4 = \frac{1529\ (4078)}{7962} = 783.13$

$E_2 = \frac{4578\ (4078)}{7962} = 2344.77$ $\quad E_5 = \frac{1855\ (3884)}{7962} = 904.90$

$E_3 = \frac{1529\ (3884)}{7962} = 745.87$ $\quad E_6 = \frac{1855\ (4078)}{7962} = 950.10$

3. Develop worksheet and calculate values.

Cell	O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
1	2015	2233.23	-218.23	47624.33	21.33
2	2563	2344.77	218.23	47624.33	20.31
3	819	745.87	73.13	5348.00	7.17
4	710	783.13	-73.13	5348.00	6.83
5	1050	904.90	145.1	21054.01	23.27
6	805	950.10	-145.1	21054.01	22.16

4. $\Sigma((O-E)^2/E) = \quad x^2 = 101.07$

5. Determine Degrees of Freedom = (r-1)(c-1) = 2
Establish Rejection Region at .05

6. Compare calculated and Table x^2; interpret result.

Table $x^2 = 5.99$

Calculated $x^2 = 101.07$

EXERCISE #4

WORKSHEET (Continued)

B. Part Two:

1. State Null Hypotheses

H_o: attitude independent of area

H_a: they are dependent

2. Calculate expected values.

$E_1 = \frac{(436)\ (498)}{879} = 247.02$ $\quad E_6 = \frac{(279)\ (248)}{879} = 78.72$

$E_2 = \frac{(436)\ (133)}{879} = 65.97$ $\quad E_7 = \frac{(164)\ (498)}{879} = 92.91$

$E_3 = \frac{(436)\ (248)}{879} = 123.01$ $\quad E_8 = \frac{(164)\ (133)}{879} = 24.81$

$E_4 = \frac{(279)\ (498)}{879} = 158.07$ $\quad E_9 = \frac{(164)\ (248)}{879} = 46.27$

$E_5 = \frac{(279)\ (133)}{879} = 42.22$

3. Develop worksheet and calculate values.

Cell	O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
1	356	247.02	108.98	11876.64	48.08
2	52	65.97	-13.97	195.16	2.96
3	28	123.01	-95.01	9026.90	73.38
4	90	158.07	-68.07	4633.52	29.31
5	31	42.22	-11.22	125.89	2.98
6	158	78.72	79.28	6285.32	79.84
7	52	92.91	-40.91	1673.63	18.01
8	50	24.81	25.19	634.54	25.58
9	62	46.27	15.73	247.43	5.35

4. $\Sigma((O-E)^2/E) = \quad x^2 = 285.50$

5. Determine Degrees of Freedom = (r-1)(c-1) = 4
Establish Rejection Region at .05.

6. Compare calculated and Table x^2; interpret result.

Table $x^2 = 9.49$

Calculated $x^2 = 285.49$

EXERCISE #4

III. CORRELATION COEFFICIENT

A. Uses

1. The correlation coefficient is a measure of association which describes the degree to which one interval or ratio scale variable is related to another.

2. Indicates the nature of strength of a relationship between two variables.

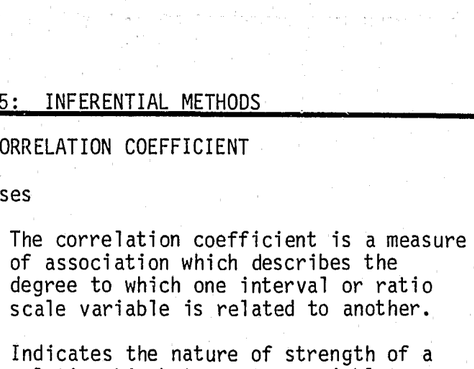
3. Reflects the shape of a distribution.

4. Correlation coefficient helps to interpret scattergrams.

B. Characteristics

SHOW V.A. (5-5):

Characteristics of r



EMPHASIZE (5-5):

+ Correlation coefficient based on two sets of measures on the same unit of analysis.

+ Values of r range from +1 to -1.

+ A positive relationship means that the measures vary directly.

+ A negative relationship means that the measures vary inversely.

C. Calculating r

SHOW V.A. (5-6):

FORMULA FOR PEARSON'S CORRELATION COEFFICIENT

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}\sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$$

Where: Y = Values of dependent variable
X = Values of independent variable
N = Number of observations

EMPHASIZE (5-6):

+ No New Symbols or Notations

+ Order of Calculation

+ Does not Determine Cause/Effect

+ Correlation coefficient should not be interpreted as a percentage, i.e., .6 is not 60%.

NOTES

D. Testing the Significance of r

SHOW V.A. (5-7):

CRITICAL VALUES OF r

	Level of Significance	
d.f.*	.05	.01
3	.878	.959
4	.811	.917
5	.754	.874
6	.707	.834
7	.666	.798
8	.632	.765
9	.602	.735
10	.576	.708
11	.553	.684
12	.532	.661
13	.514	.641
14	.497	.623
15	.482	.606

*d.f. - degrees of freedom = n-2

Source: Snedecor, George W. & Cochran, William G. Statistical Methods, 6th Edition. University Press, 1974, p. 557. Ames, Iowa: Iowa State

EMPHASIZE (5-7):

+ Test is for H_0: $\rho = 0$
  (rho) ρ = population r

+ If absolute value of r from a sample of size n exceeds the table value for a specified α and n-2 degrees of freedom, the null hypothesis may be rejected.

CORRELATION COEFFICIENT

PURPOSE

To illustrate how to calculate and interpret a correlation coefficient. Calculate the correlation coefficient for the murder rates in 1971 and 1974 for the ten southern cities in Table 1. Test the significance of r and interpret the result.

INSTRUCTOR NOTES

A. Tell the participants to scan the data set with you.

B. Tell them to follow you on their worksheets as you explain how to calculate a correlation coefficient.

C. Emphasize the following:

1. Requires quantitative data.

2. Does not indicate intervening factors.

3. Does not preclude spurious relationships.

4. With small samples, a high correlation may result from an extreme pair of values.

5. Low correlations do not necessarily indicate a nonlinear relationship; there may be a curvilinear one.

6. The range of values must be large and should not be discontinuous.

7. Less reliable with values of r close to zero.

D. Walk-Through should last no more than 10 minutes.

DATA SET

Table 1. Murder Rates for Thirty Cities from the North, South and West, 1971 and 1974

South	1971	1974
Atlanta, Ga.	20	21
Augusta, Ga.	22	17
Birmingham, Ala.	14	18
Charlotte, N.C.	25	18
Corpus Christi, Tex.	13	14
Dallas, Tex.	18	15
Houston, Tex.	17	19
Richmond, Va.	15	15
Washington, D.C.	11	13
Wichita Falls, Tex.	6	14
North		
Albany, N.Y.	3	3
Atlantic City, N.J.	5	15
Chicago, Ill.	13	16
Detroit, Mich.	15	20
Grand Rapids, Mich.	3	4
Lancaster, Pa.	2	1
Madison, Wis.	2	2
Pittsfield, Mass.	1	1
South Bend, Ind.	6	8
Syracuse, N.Y.	4	4
West		
Boise, Idaho	5	4
Denver, Colo.	8	7
Fresno, Calif.	8	13
Honolulu, Hawaii	4	9
Kansas City, Mo.	13	12
Sacramento, Calif.	6	7
St. Louis, Mo.	15	14
San Francisco, Calif.	8	12
Seattle, Wash.	4	6
Vallejo, Calif.	4	9

*Rates represent the number of murders per 100,000 population rounded to nearest whole number.

Sources: Sourcebook, 1976; also, Mendenhall, Ott and Larson. Statistics for the Social Sciences, 1975.

WORKSHEET

A. Calculate r

1. Prepare Matrix

CITY	X	Y	XY	X^2	Y^2
1	20	21	420	400	441
2	22	17	374	484	289
3	14	18	252	196	324
4	25	18	450	625	324
5	13	14	182	169	196
6	18	15	270	324	225
7	17	19	323	289	361
8	15	15	225	225	225
9	11	13	143	121	169
10	6	14	84	36	196
Σ	161	164	2723	2869	2750

2. $(X)^2 = 25921$

   $(Y)^2 = 26896$

3. $$r = \frac{N\,XY - (X)(Y)}{N\,X^2 - (X)^2 \quad N\,Y^2 - (Y)^2}$$

$$r = \frac{10\,(2723) - (161)(164)}{10(2869) - (161)^2 \quad 10(2750) - (164)^2}$$

$r = .639$

4. Table r = .632 (d.f. = n-2 = 8, = .05)

WALK-THROUGH 'J'

EXERCISE #5

CORRELATION COEFFICIENT

PURPOSE

To give the participants an opportunity to calculate and interpret a correlation coefficient.

INSTRUCTIONS

A. Calculate and interpret the correlation coefficient between population density and larceny offenses for 13 counties in Florida.

B. Determine the significance of r. (Refer to the V.A. 5-8 for critical values of r.)

INSTRUCTOR NOTES

A. Reexamine the scattergram developed in Exercise 5 prior to having participants begin calculation of the correlation coefficient. A copy of the scattergram is provided in the Data Set.

B. Ask them to determine whether the correlation between larceny and population density is significant. V.A. 5-8 contains critical values of r. Note that in the worksheet larceny values have been recorded in hundreds to avoid the problem of calculator overflow.

C. Have them interpret their results.

D. Schedule:

1. Preparation (5 min.)
2. Activity (25 min.)
3. Debriefing (10 min.)

DEBRIEFING NOTES

A. Indicate the first step in conducting analysis of this data is to calculate means and standard deviations for the two variables:

-- Population Density: $\overline{X}$ = 333; SD = 182

-- Reported Larceny: $\overline{Y}$ = 11,690; SD = 7,315

B. The second step is to prepare a scattergram, which in this case is provided in the scattergram exercise in Module 4.

C. The third step is to calculate the correlation coefficient, r = .58. This is calculated with Y expressed in hundreds. In actual units r = .60. Thus, the error due to rounding = .02.

D. According to Table for Critical Values of r for α =.05 with n = 13, the r value is .487. Therefore, the correlation coefficient is significant. We can conclude that there is a positive and moderate relationship between population density and larceny in these 13 counties.

E. Go over the worksheet with the required values worked out and have the participants compare their calculations.

F. Show them the substitutions in the formula and the r = .60.

G. If any difficulties were observed by you or the facilitator, clear up the problems.

H. Indicate the following:

1. To use r you must have two variables that are at least interval level.
2. Assumes a linear relationship.
3. Does not prove causality; only logic--not statistics--provides proof, statistics suggest evidence.
4. Larger the sample size, the more powerful r is.

EXERCISE #5

DATA SET

Table 1. Reported Larceny by Population Density
Thirteen Florida Counties, 1977

COUNTY	POPULATION PER SQ. MILE 7-1-77	REPORTED LARCENY OFFENSES
1. Alachua	146	5,740
2. Duval	748	21,645
3. Hillsborough	581	25,040
4. Orange	467	17,920
5. Polk	151	10,750
6. Leon	202	5,495
7. Volusia	206	11,700
8. Seminole	466	2,930
9. Escambia	345	10,215
10. Sarasota	291	5,840
11. Brevard	252	9,085
12. Lee	220	4,775
13. Palm Beach	250	20,830

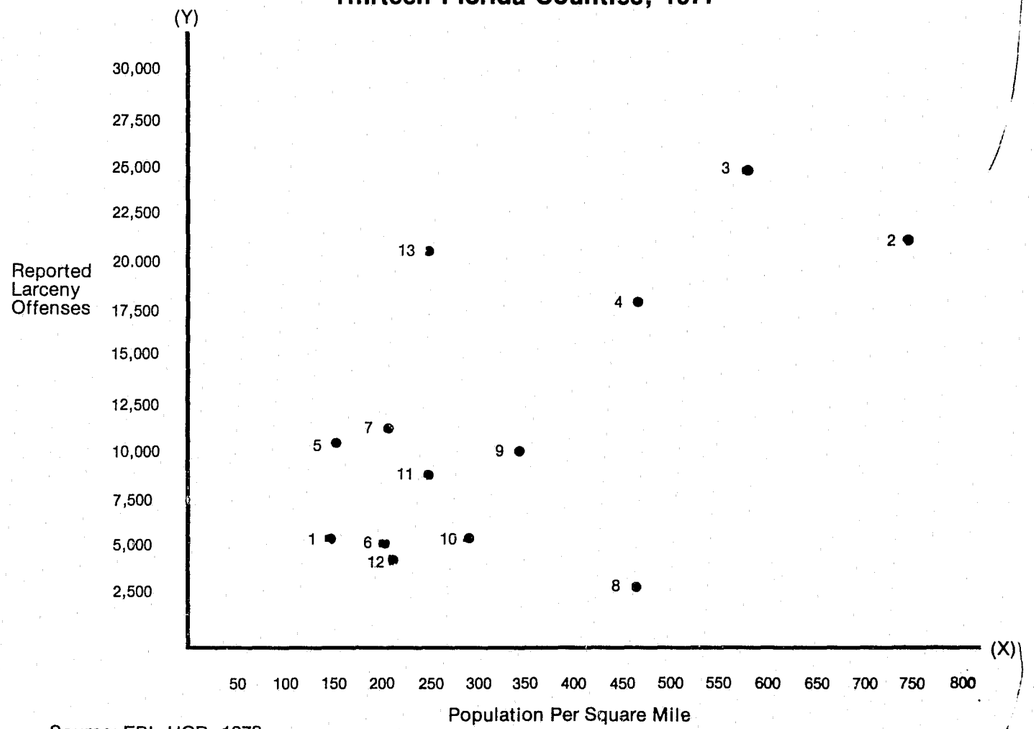
Source: FBI, UCR, 1978

EXERCISE #5

DATA SET

V-28-IG

**Reported Larceny by Population Density,
Thirteen Florida Counties, 1977**



Source: FBI, UCR, 1978

EXERCISE #5

WORKSHEET

A. Develop worksheet and calculate required values

COUNTY	X	Y (In hundreds)	XY	X^2	Y^2
1	146	57	8,322	21,316	3,249
2	748	217	162,316	559,504	47,089
3	581	250	145,250	337,561	62,500
4	467	179	83,593	218,089	32,041
5	151	108	16,308	22,801	11,664
6	202	55	11,110	40,804	3,025
7	206	117	24,102	42,436	13,689
8	466	29	13,514	217,156	841
9	345	102	35,190	119,025	10,404
10	291	58	16,878	84,681	3,364
11	252	91	22,932	63,504	8,281
12	220	48	10,560	48,400	2,304
13	250	208	52,000	62,500	43,264
	4,405	1,519	602,075	1,837,777	241,715

B. Substitute in formula

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N(\Sigma X^2) - (\Sigma X)^2}\ \sqrt{N(\Sigma Y^2) - (\Sigma Y)^2}}$$

$$r = \frac{13\ (602,075) - (4405)(1519)}{\sqrt{13(1,837,777) - (4405)^2}\ \sqrt{13\ (241,715) - (1519)^2}}$$

$$= \frac{1135780}{\sqrt{4487076}\ \sqrt{834934}}$$

$$= \frac{1135780}{(2118.272)(913.747)}$$

$$= .58$$

C. Test Significance (d.f. = n-2 = 11, $\alpha = .05$, $r = .553$)

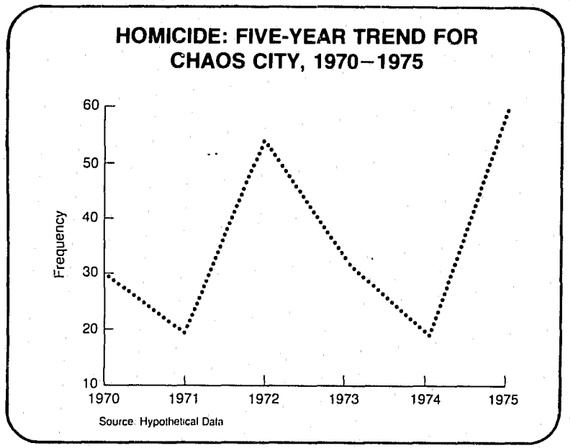
$r_{.553} > r_{.457}$ = Significant relationship between reported larceny offenses and population per square mile.

EXERCISE #5

IV. REGRESSION

A. Time Series Data

SHOW V.A. (5-8):



EMPHASIZE (5-8):

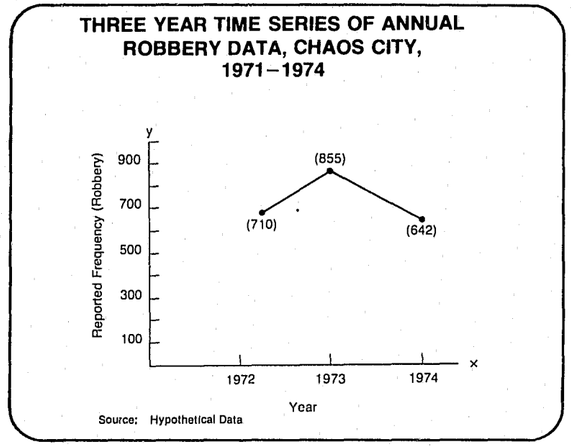
+ A planner may discover that the homicide rate in Chaos City increased significantly in 1975, a fact that might encourage consideration of a range of programmatic responses.

+ A review of crime trends for the prior five years might disclose that the homicide rate is susceptible to large proportional changes--both increases and decreases.

+ The planner could then reasonably conclude that the increases in 1975 do not represent a fundamental shift.

1. Short Time Series

SHOW V.A. (5-9):



EMPHASIZE (5-9):

+ Generally, one can make more accurate forecasts on the basis of longer time series than on the basis of shorter ones.

+ Shorter time series have a tendency to mask irregular (anomalous) fluctuations.

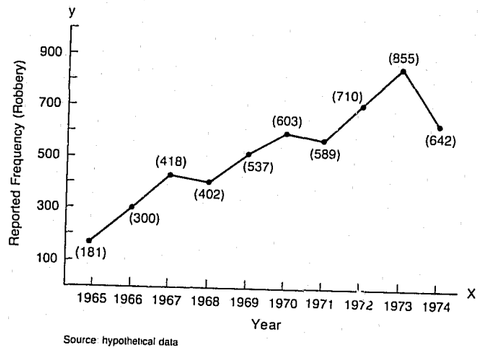
+ For example, a three-year series of annual robbery data might look like that which appears in V. A. 5-10.

+ Accuracy may decrease with shorter time series.

2. Extended Time Series

SHOW V.A. (5-10):

TEN YEAR TIME SERIES OF ANNUAL ROBBERY DATA, CHAOS CITY, 1965–1974



Source hypothetical data

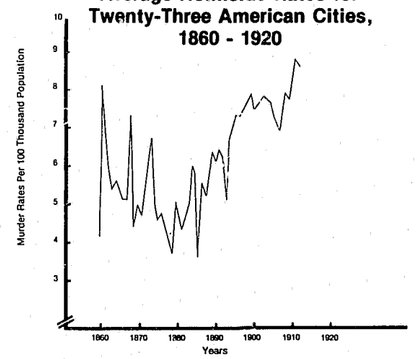
EMPHASIZE (5-10):

+ A longer, ten-year series may reveal a very different trend, as seen in V.A. 5-11.

+ In order to minimize the error in prediction, it is necessary to use as long a time series as is available. However, length alone does not assure accuracy.

SHOW V.A. (5-11):

Average Homicide Rates for Twenty-Three American Cities, 1860 - 1920



Source: University of Michigan, National Criminal Justice Archives, Based on Official Police Records in 23 American Cities, 1978.

EMPHASIZE (5-11):

+ Extended time series are subject to discontinuities or interruptions.

+ Note changing directions and magnitude of the trendline and its relationship to major events, e.g., World War I., Depression.

B. Visual Estimation of Regression Line.

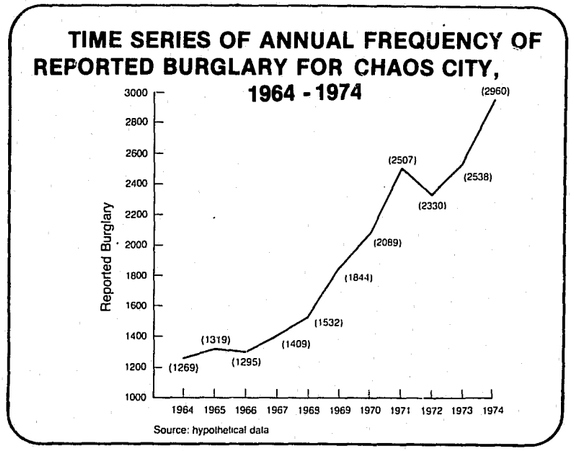
1. Procedures.

a. The first step is to fit a straight line through the time series which minimizes the distance between the data and the line.

b. Step two is to extend the line and "read" the resulting point estimate of a future value for the measure.

2. EXAMPLE:

SHOW V.A. (5-12):

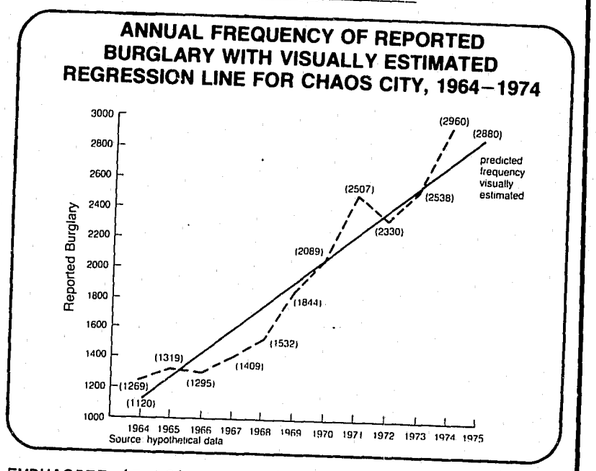


EMPHASIZE (5-12):

+ Data on reported annual incidents of burglary in Chaos City.

+ Strong indication of constant increase in incidents.

SHOW V.A. (5-13):



EMPHASIZE (5-13):

+ Line fitted to data.

+ Estimated prediction for 1975 is 2880 based on line.

+ This is a crude point estimate; least-squares regression defines the line algebraically, consequently, with greater precision.

+ A rough estimation is difficult to make with many scattered points.

+ Assumes all relevant factors will continue to operate as in the past.

+ Precision generally decreases with shorter time series and with highly fluctuating data.

+ This example assumes a straight line (linear) relationship. Visually the data suggest an exponential curve. Consequently we might estimate a higher incidence of burglary than 2800.

NOTES

C. Least Squares Regression

1. Purpose

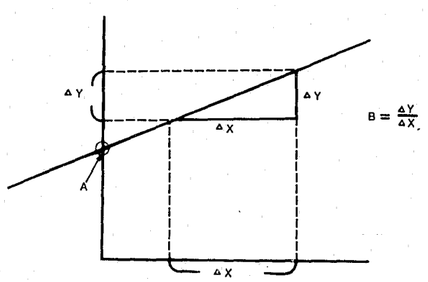
   a. To aid in forecasting where there are trends in time series data.

   b. To measure "best fit" for an estimating line.

2. Procedure for algebraically determining a straight line:

SHOW V.A. (5-14):

Slope and Y-Intercept



EMPHASIZE (5-14):

+ A is the Y-intercept.

+ B is the slope.

+ Changing either the A or B, changes the line.

NOTES

SHOW V.A. (5-15):

FORMULA FOR REGRESSION COEFFICIENTS

Step 1: $$B = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

Step 2: $$A = \frac{\Sigma Y - B\Sigma X}{N}$$

Step 3: $$\hat{Y} = A + BX$$

EMPHASIZE (5-15):

+ B and A can be algebraically determined providing greater accuracy than a graphic estimation.

+ Procedure involves three steps.

  (1) Determine B - the slope.

  (2) Determine A - the Y intercept.

  (3) Using the derived equations, estimate a predicted value of y, given a value for x.)

NOTES

3. Assessing the Utility and Accuracy of a Least Squares Prediction

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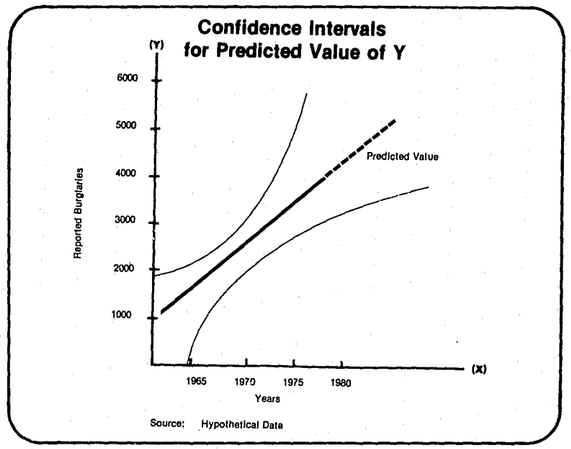
SHOW V.A. (5-16):



EMPHASIZE (5-16):

+ Confidence interval increases as estimate moves farther from existing data.

+ Widening interval indicates increased likelihood of error in estimate.

+ Consequently, should not predict five years ahead with five years of data.

+ Confidence interval about a point estimate determined algebraically using a 't' distribution.

REGRESSION

PURPOSE

To give participants the opportunity to make projections using linear regression.

INSTRUCTIONS

A. Using only a ruler and the provided graph paper, visually estimate 1978 and 1979 homicides for Chaos City.

B. Using the formulas provided, calculate A and B, the regression coefficients for these data.

C. On the same piece of graph paper, draw the least squares regression line. Locate the regression line by using the formula $\hat{y} = A + Bx$ for at least two data pairs.

D. Predict the 1978 and 1979 homicides using the regression model calculated.

INSTRUCTOR NOTES

A. Explain the problem, Data Set, and use of Worksheet.

B. Schedule:

1. Preparation (5 minutes)
2. Activity (30 minutes)
3. Debriefing (10 minutes)

EXERCISE #6

DATA SET

Exercise #6
Table 1. Homicides in Chaos City, 1967 - 1977

YEAR (X)	HOMICIDES (Y)
1967	12
1968	13
1969	12
1970	14
1971	15
1972	18
1973	20
1974	25
1975	23
1976	25
1977	29

Source: FBI, UCR, 1978.

WORKSHEET

A. Complete the following table.

X	Y	XY	X^2
1	12	12	1
2	13	26	4
3	12	36	9
4	14	56	16
5	15	75	25
6	18	108	36
7	20	140	49
8	25	200	64
9	23	207	81
10	25	250	100
11	29	319	121
$\Sigma = 66$	206	1429	506

B. Calculate the slope (B)

$$B = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

$$B = \frac{11(1429) - (66)(206)}{11(506) - (66)^2}$$

$$B = \frac{2123}{1210}$$

$$B = 1.75$$

EXERCISE #6

WORKSHEET Continued:

C. Calculate the Y intercept (A)

$$A = \frac{\Sigma Y - B(\Sigma X)}{N}$$

$$A = \frac{206 - 1.75(66)}{11}$$

$$A = 8.23$$

D. Substitute calculated values of A and B in equation.

$$\hat{y} = A + BX$$

$$\hat{y} = 8.23 + 1.75\ X$$

E. Substitute two arbitrary values of x into the equation and plot the line.

1.

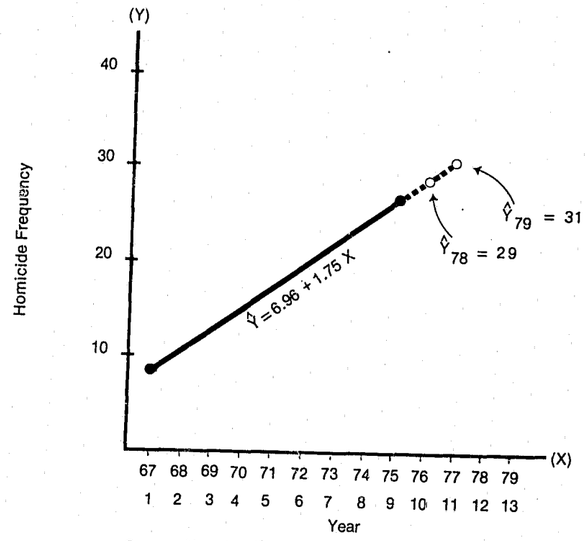
X	$\hat{Y}$
1	9.98
10	25.73

2. Now plot the line on graph paper.

WORKSHEET Continued:

SHOW ANSWER: (Answer 5-a)

Homicides, Chaos City, 1967 - 77
With Projections to 1979



Source: Hypothetical Data

F. Estimate 1979 predicted homicide rate:

1. If 1978 = 12

   1979 = 13

2. Y_{78} = 8.23 + 1.75 (12)

   Y_{78} = 29 homicides

   Y_{79} = 8.23 + 1.75 (13)

   Y_{79} = 31 homicides

EXERCISE #6

DEBRIEFING NOTES

A. Step-by-step, lead participants through the worksheet.

B. Compare visually estimated lines and the calculated regression lines.

1. Direction and Slope of Regression Line

2. Intercept and Predicted Value

C. Point out:

1. Assumption that all relevant factors will continue to operate as in the past.

2. Accuracy decreases with shorter time series and highly fluctuating data.

3. The conclusions are less reliable with lower values of r. Correlation coefficient equals .96.

4. Provides no information about variability by itself.

5. Does not preclude spuriousness.

D. Least squares regression builds upon descriptive statistics ($\bar{Y}$ = 18.72 homicides, S_y = 6.03 homicides), the scattergram, and must be based on a strong conceptual foundation as outlined in a problem specification.

EXERCISE #7

INTERPRETATION OF FINDINGS

PURPOSE

This exercise demonstrates the process of specifying a system problem using the methods just discussed. It provides practice in interpreting the statistics of Modules 3, 4 and 5.

The concern examined in the exercise is parolee recidivism, and specifically the relationship, if any, between parolee recidivism and the caseload of parole officers in Chaos City. Provided are some of the measures and related statistics needed to analyze the problem.

INSTRUCTIONS

A. For the problem you are to:

1. Consider the underlying issues implicit or explicit in the concern

2. Become familiar with the particular data involved

3. Consider the validity and reliability of the measures

4. Consider the adequacy and limitations of the statistical operations performed

B. In the final product, for each question, you are to:

1. Interpret the statistics, stating their meaning and significance

2. Note the major possible limitations on the interpretation

3. Outline other factors bearing on the interpretation

C. Questions to be answered:

1. Describe the trend in the number of parole recidivists during the past five years.

2. What is the estimate of the parolee recidivism rate for 1978?

3. What affect does the workload of parole officers have on the recidivism rate?

4. If existing workloads (142 cases/officers in 1977) were reduced by 20% what affect would this have on recidivism rates?

5. Is the workload of parole officers related to the incidence of technical violations by parolees?

BRIEFING NOTES

A. The exercise covers material presented in Modules 3, 4, 5 and 6.

B. The exercise deals with the measurement and examination of the relationships between the system concepts.

C. Explain purpose of exercise as outlined above.

D. Explain desired products as outlined in Activities Section of student guide.

E. Walk-through the Data-Set--system and sub-system measures--indicating which concept is being measured.

F. Point out the three "givens" of the problem (1) Questions, (2) Concepts and Measures, and (3) Statistics. Indicate participants are to provide interpretation.

G. Indicate the Exercise's schedule:

1.	Briefing	10 min.
2.	Activities	50 min.
3.	Debriefing	20 min.

H. The first two questions may be done with participants interacting still in the class, or it may be done by each group separately.

SHOW V.A. (5-17)

Each Problem Provides

- Questions
- Concepts and Measures
- Statistics

You Provide:

- Answers
- Interpretations
- Limitations
- Other Factors

DATA SET

Table 1. Selected System Measures, Chaos City, 1973-1977

Parole Sub-system Indicators	1973	1974	1975	1976	1977
A. Number of Parolees					
(1) District A	1160	1090	990	1064	1098
(2) District B	1248	1157	1093	1128	1202
(3) District C	1008	981	985	936	966
Total	3416	3228	3068	3128	3226
B. Parolees with Technical Violations					
(1) District A	358	360	314	295	351
(2) District B	220	195	209	189	210
(3) District C	446	413	391	411	378
Total	1024	968	914	895	939
C. Parolees with no Technical Violations					
(1) District A	802	730	676	769	747
(2) District B	1028	962	884	939	992
(3) District C	562	568	594	525	588
Total	2392	2260	2154	2233	2327
D. County Caseload/ Officer					
(1) District A	111	114	129	120	137
(2) District B	132	128	162	152	172
(3) District C	77	75	120	115	121
Average	107	106	136	127	142
E. Recidivism Rate (number rearrested/100 parolees)	14.8	14.6	18.3	16,2	19.8

Source: Department of Corrections, State of Paradise, Chaos City Office, 1978.

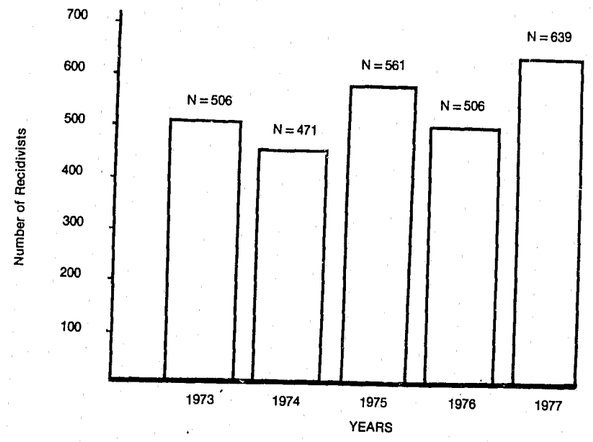
EXERCISE #7

DATA SET

QUESTION #1: Describe the trend in the number of recidivists during the past five years.

Table 2.

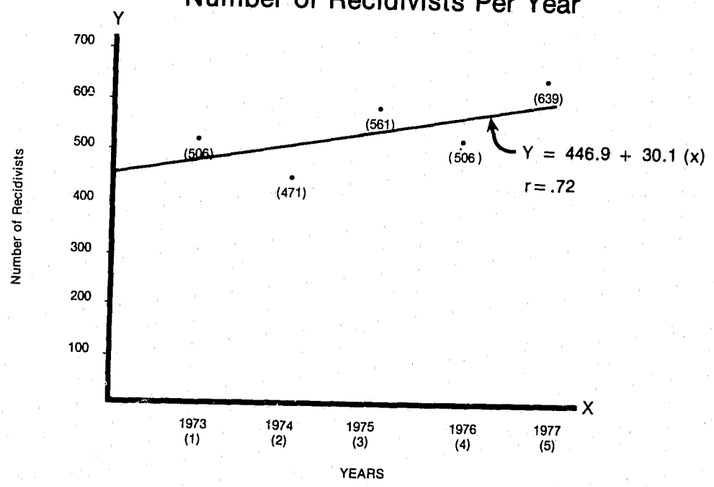
Number of Recidivists Per Year



Source: Chaos City Dept. of Corretions, 1978.

Table 3.

Number of Recidivists Per Year



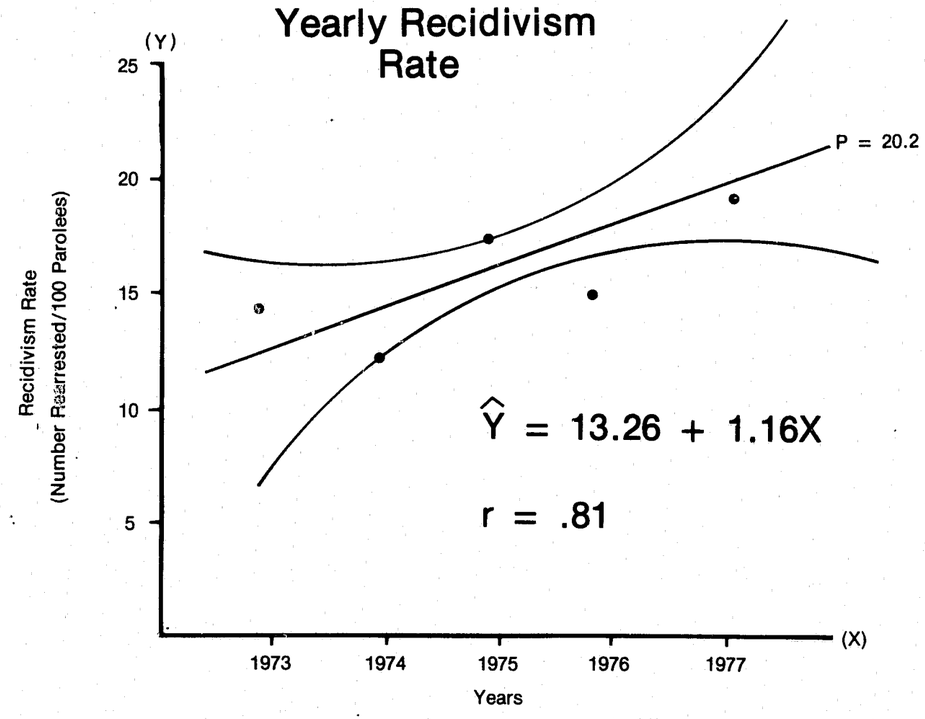
Source: Chaos City Dept. of Corrections

EXERCISE #7

DATA SET

QUESTION #2: Estimate the parolee recidivism rate for 1978.

Table 4.



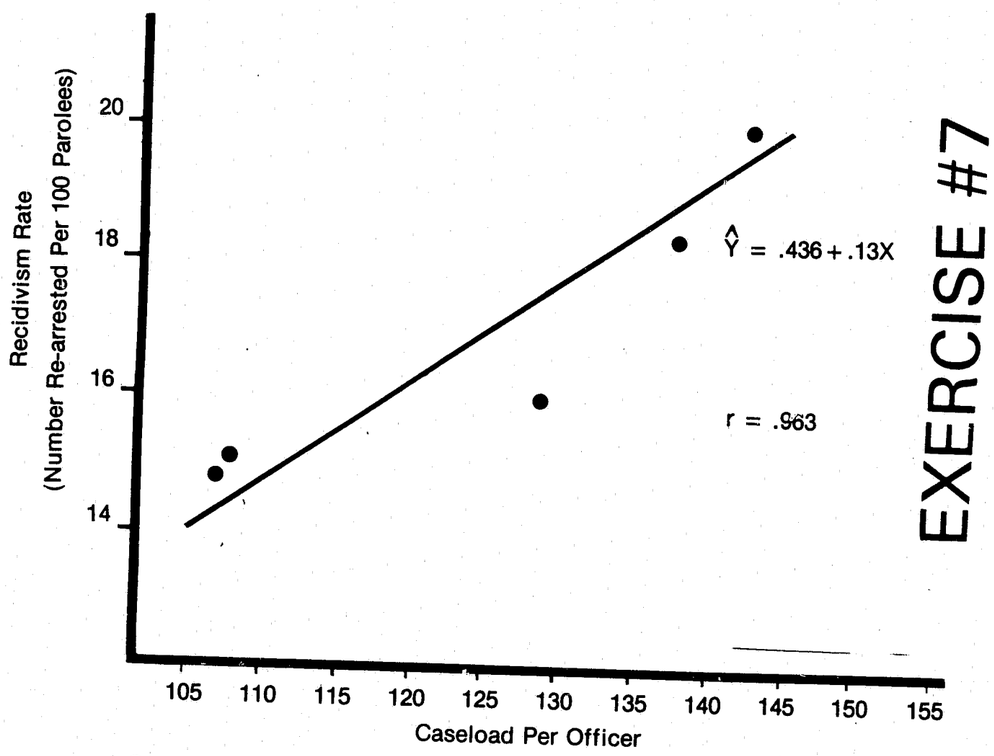
Source: Chaos City Dept. of Corrections, 1978.

EXERCISE #7

DATA SET

QUESTION #3: What affect does the workload of parole officers have on the recidivism rate?

Table 5.



Source: Chaos City Dept. of Corrections

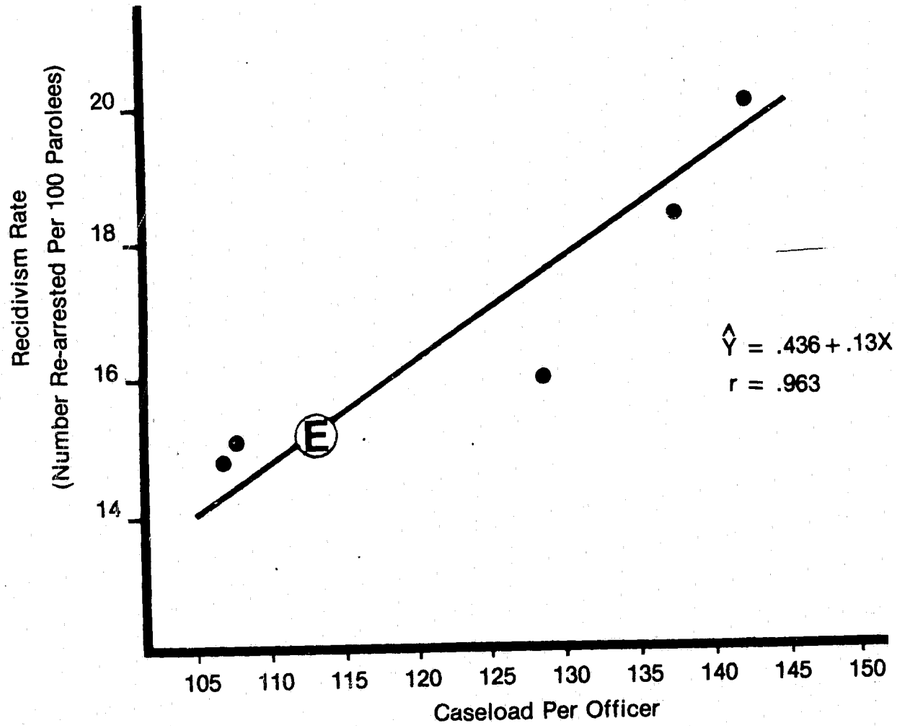
EXERCISE #7

DATA SET

QUESTION #4: If existing workloads were reduced 20%, what affect would this have on recidivism?

Table 6.

Recidivism Rate Related to Parole Officer Caseload



Source: Chaos City Dept. of Corrections

EXERCISE #7

DATA SET

QUESTION #5: Is the workload of parole officers related to the incidence of technical violations by parolees?

Table 7.

INCIDENCE OF TECHNICAL VIOLATIONS BY PAROLE OFFICER CASELOAD

	CASE LOAD			
	Low (70-109)	Medium (110-149)	High (150-189)	Totals
Parolees with Technical Violations	859** (76.0%)	3273 (30.6%)	608 (17.8%)	4740 (29.4%)
Parolees with no Technical Violations	1130 (24.0%)	7421 (69.4%)	2815 (82.2%)	11366 (70.6%)
Totals	1989 (100%)	10694 (100%)	3423 (100%)	16106*

*Total from rows B and C of Table 1 for all five years.

**Cell counts determined by categorizing parolees by caseload for each district for each year.

a. χ^2 calculated = 412.76

b. χ^2 (.05, 2df.) = 5.91

EXERCISE #7

WORKSHEET

A. Describe the trend in the number of parole recidivists during the past five years.

1. Answer/Interpretation

2. Limitations/Qualifications

3. Other Factors

B. Estimate the parolee recidivism rate for 1978.

1. Answer/Interpretation

2. Limitations/Qualifications

3. Other Factors

C. What affect does the caseload of parole officers have on the recidivism rate?

1. Answer/Interpretation

EXERCISE #7

WORKSHEET

2. Limitations/Qualifications

3. Other Factors

D. If existing workloads were reduced by 20%, what affect would this have on recidivism?

1. Answer/Interpretation

2. Limitations/Qualifications

3. Other Factors

E. Is the workload of parole officers related to the incidence of technical violations committed by parolees?

1. Answer/Interpretation

2. Limitations/Qualifications

3. Other Factors

EXERCISE #7

DEBRIEFING NOTES

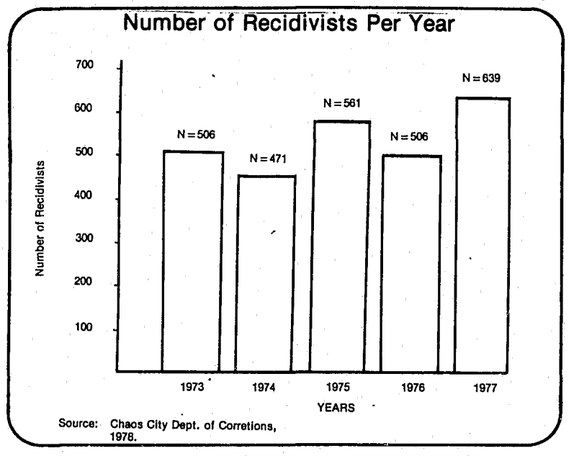
A. If the first two questions are done as an interactive Walk-Through, the participants do not go to breakout rooms until Question 2 is completely debriefed and discussed. After Question 2 the groups go to separate rooms to do the remaining questions.

B. If all the questions are analyzed in the breakout rooms, they are debriefed at the same time.

C. Question 1

Describe the trend in recidivism for parolees during the past five years?

SHOW ANSWER (Answer 6-a):



EMPHASIZE (Answer 6-a):

+ $\overline{X}$ = 536 Recidivists
+ s = 66 Recidivists
+ Average Annual % Change = 7.2% in Recidivists
+ Percent Change 1973 to 1977 is 26.3%
+ Number of Recidivists = Recidivism Rate X Number of Parolees.

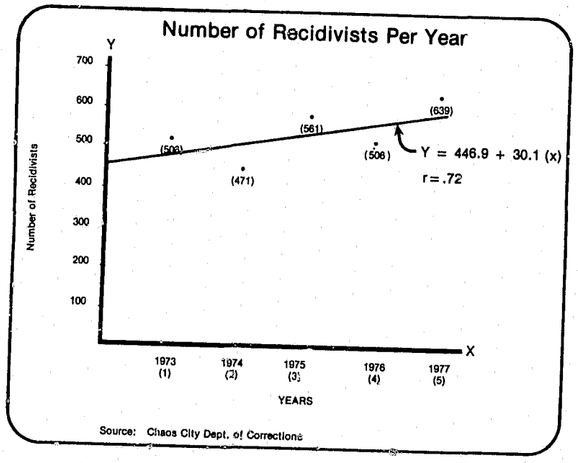
EXERCISE #7

DEBRIEFING NOTES

+ Limitations:

(1) Small data set
(2) Need to extend data base
(3) Take x-section of most recent year
(4) Develop monthly data on recidivism for the period
(5) Other variables

SHOW ANSWER (Answer 6-b):



EMPHASIZE (Answer 6-b):

+ Slight Upward Trend
+ Only a Fair Fit of the Regression Line: r^2 = .53
+ Estimate of Annual Increase is 30 Recidivists

EXERCISE #7

CONTINUED

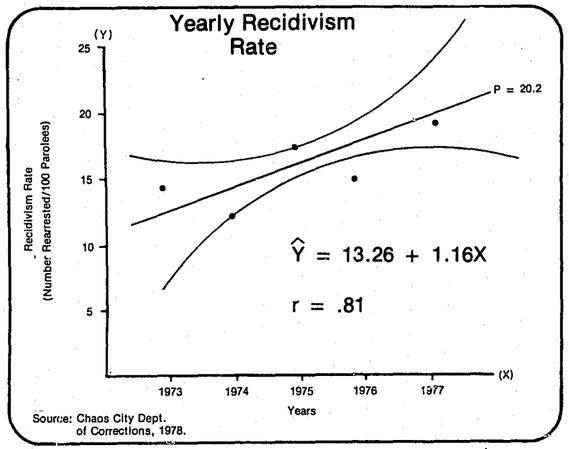
3 OF 5

DEBRIEFING NOTES

D. Question #2

What is the estimate of the parolee recidivism rate for 1978?

SHOW ANSWER (Answer 6-c):



EMPHASIZE (Answer 6-c):

+ Prediction equation $\hat{Y} = 13.26 + 1.16X$

+ 1978 is 6th year, $X = 6$

$\hat{Y} = 13.26 + 1.16\ (6)$

$\hat{Y} = 20.22$ Recidivists

+ Decreasing confidence in estimate the farther the estimate is from the actual data indicated by confidence interval

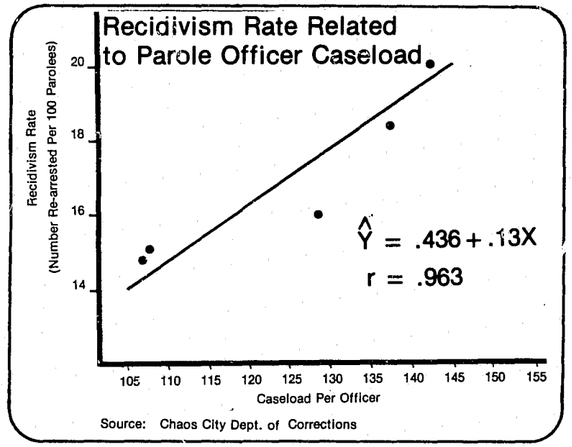
+ Only five data points

DEBRIEFING NOTES

E. Question #3

What effect does the caseload of parole officers have on the recidivism rate for the city?

SHOW ANSWER (Answer 6-d):



EMPHASIZE (Answer 6-d):

+ Describe X and Y $\quad \bar{X} = 123.6 \quad S_x = 16.5 \quad \bar{Y} = 16.7 \quad S_y = 2.3$

+ Strong relationship r = .963, Significant at .05

+ Regression line fits data very well

+ Indicates higher recidivism rates tend to be associated with higher workloads

+ Caseload increase of 8, increases the recidivism rate by about 1 person/100 parolees

+ As workload (cases/officer) is reduced performance (recidivism) improves

+ Limitations:

(1) Small data set, although line fits data well

(2) Caseload per officer and recidivism may be functions of other variables

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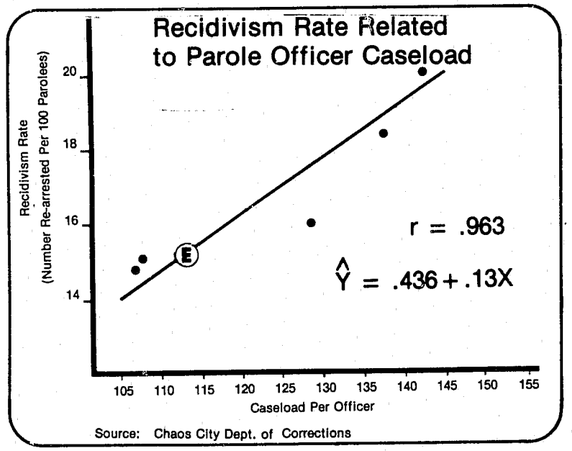
DEBRIEFING NOTES

F. Question #4

If existing caseloads were reduced 20% what affect would this have on recidivism?

SHOW ANSWER (Answer 6-e):



EMPHASIZE (Answer 6-e):

+ Caseload in 1977 = 142

+ Prediction Equation $\hat{Y} = .436 + .13X$

  20% Reduction: = 113.6

  If X = 113.6 $\hat{Y}$ = .436 + .13 (113.6) = 15.2 Recidivists/100 parolees.

+ Interpretation:

Change in Administration	Change in Resources	Change in Workload/ Capabilities	Change in Performance

+ Limitations:

  (1) Small data set, although line fits data well
  (2) Other variables may be responsible for relationship
  (3) Projections outside range of data are suspect but not in this case

EXERCISE #7

DEBRIEFING NOTES

G. Question #5

Is the caseload of parole officers related to the incidence of technical parole violations?

SHOW ANSWER (Answer 6-f):

INCIDENCE OF TECHNICAL VIOLATIONS BY PAROLE OFFICER CASELOAD

	CASELOAD Low 70-109	Medium 110-149	High 150-189	
Parolees with Technical Violations	859 (76.0%)	3273 (30.6%)	608 (17.8%)	4740 (29.4%)
Parolees with no Technical Violations	1130 (24.0%)	7421 (69.4%)	2815 (82.2%)	11366 (70.6%)
	1989 (100%)	10694 (100%)	3423 (100%)	16106*

Source: Chaos City Dept. of Corrections, 1978.

*Total from Rows B and C of Table 1 for all five years

X^2 calculated = 412.76
X^2 .05, 2df. = 5.99

EMPHASIZE (Answer 6-f):

+ There appears to be a significant, negative relationship between caseload size and the incidence of technical violation.

+ Chi Square test of independence confirms a dependent classification.

+ Comparing results from Question #4 and Question #5:

  A decrease in caseload will decrease recidivism, but is likely to increase technical violations. A typical tradeoff for these types of problems.

+ 76% of the parolees supervised on a low caseload had a technical violation while only 17.8% of the parolees supervised on a high caseload had technical violations.

EXERCISE #7

DEBRIEFING NOTES

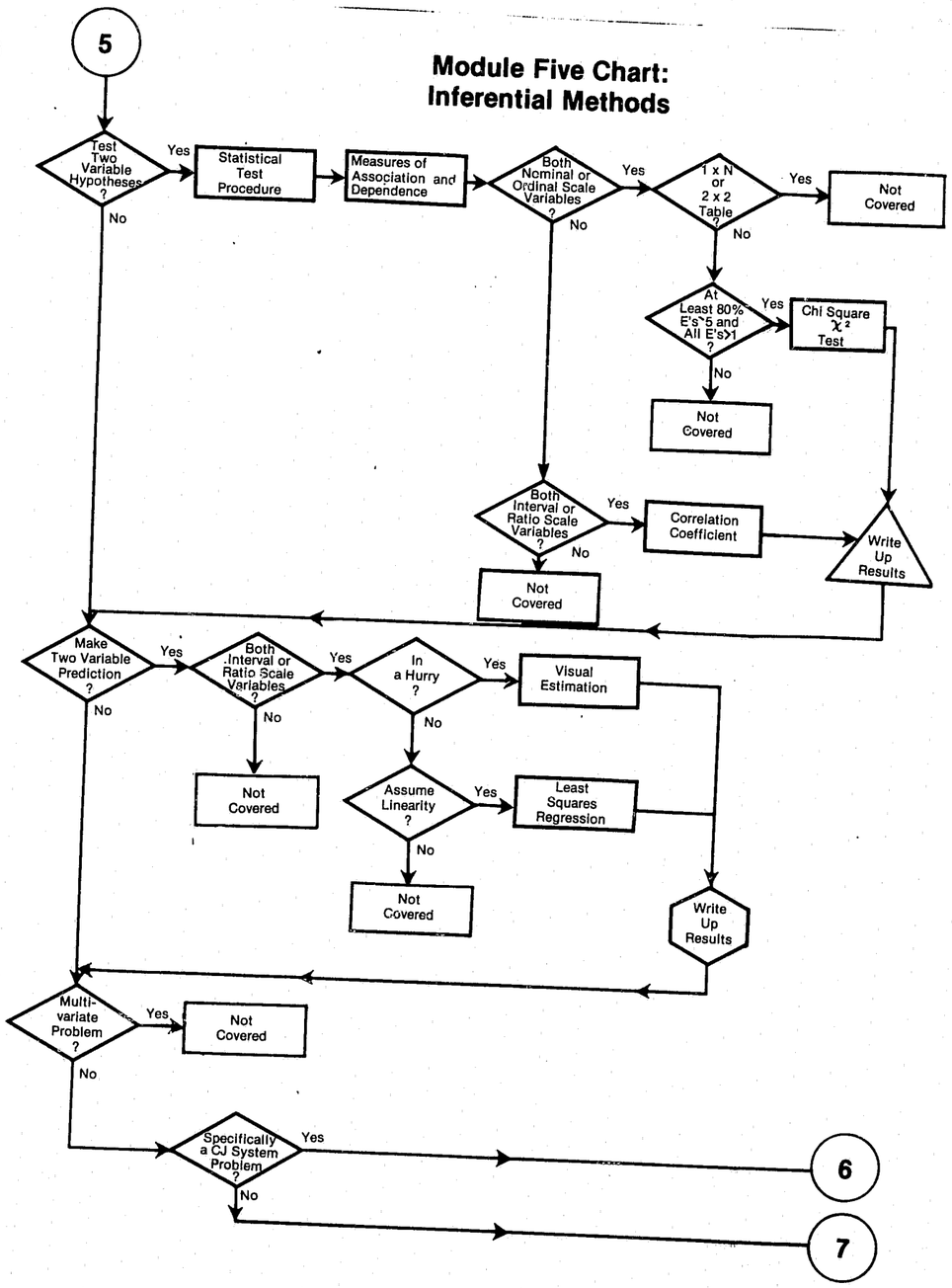
+ Validity questions: Are parolee technical violations a fair measure of performance? Is caseload per officer an accurate measure of workload (i.e., varying requirements of individual cases for supervision.)

+ Reliability questions: What changes over time occurred in counting caseloads and violations?

V. CONCLUSION

Review the Module Chart and respond to participant questions. Begin the Briefing of Task #3 of the Major Exercise.

SHOW V.A. (5-18):



Calculator Workshop

WORKSHOP

Introduction to the Advanced Calculator

The purpose of this workshop is to introduce the use of an advanced hand calculator as an exploratory and labor saving tool in the analysis process. Specifically, this workshop covers basic operations, statistical operations and the programming capability of the TI55 calculator.

WORKSHOP ADVANCED CALCULATOR

I. BASIC OPERATIONS

A. Arithmetic Operations

Calculate each of the following:

1. 2930 + 5740 =
2. 2930 - 5740 =
3. 2930 - 5740 =
4. 2930 x 5740 =
5. 2930^2 =
6. $\sqrt{2930}$ =

PRESS	DISPLAY	COMMENT
CLR	0	Clears Machine
2930 +	2930.	Enter Data
5740 =	8670.	The Result of the Addition
CLR	0	
2930 -	2930.	Enter Data
5740 =	-2810.	The result of Subtraction
CLR	0	
2930 -	2930.	Enter Data
5740 =	0.510453	The Result of Division
CLR	0	
2930 x	2930.	Enter Data
5740 =	16818200.	The Result of Multiplication
CLR	0	
2930 X2	8584900.	The Result of Squaring
CLR	0	
2930 √X	54.129474	The Resulting Square Root

WORKSHOP ADVANCED CALCULATOR

B. Parentheses and Fixed Decimal Control

Calculate to three decimal places the following:

$$\frac{(3X4) + (9X -2)}{\sqrt{(4 + 2)\ X\ .5}} =$$

PRESS	DISPLAY	COMMENT
CLR	0	
2nd FIX 3	0.000	Fixes All Subsequent Results at 3 Decimal Places
((3 X 4)	12.000	(3X4) Displayed
+ (9 X 2 +/-))	-6.000	Value of Numerator
÷ ((4 + 2)	6.000	(4+2) Displayed
X . 5)	3.000	(6X.5) Displayed
√X	1.732	Value of Denominator
=	-3.464	The Result

C. Percent Change

If the homicide rate in Chaos City in 1970 was 14 and the rate in 1977 was 29, what was the percent change in the homicide rate?

PRESS	DISPLAY	COMMENT
CLR	0	
2nd FIX 2	0.00	Set 2 Decimal Places
29 2nd Δ%	29.00	Enter Most Recent Year First
14 =	107.14	Percent Change

D. Constants

The total number of robberies in 1977 for five cities in the State of Paradise was 5130, 4920, 3170, 9200 and 4301. What was the average monthly number of robberies in each city?

PRESS	DISPLAY	COMMENT
CLR		
2nd FIX 0	0	Rounds to Nearest Integer
12 ÷ 2nd const	12	Divides Each Subsequent Entry by 12
5130 =	428.	Average Monthly Number of Robberies in the Five Cities
4920 =	410.	
3170 =	264.	
9200 =	767.	
4301 =	358.	

II. STATISTICAL OPERATIONS

A. Mean and Standard Deviation

Describe the incidence of reported larcenies for the 13 Florida counties presented in Table 1.

PRESS	DISPLAY	COMMENT
2nd CA	0	Clears Entire Machine
2nd FIX 2	0.00	Set Decimal to 2 Places
5740 Σ+	1.00	Enter First Data Point; Calculator Counts and Displays The Data Points
21645 Σ+	2.00	
25040 Σ+	3.00	
17920 Σ+	4.00	
10750 Σ+	5.00	
5495 Σ+	6.00	
11700 Σ+	7.00	
2930 Σ+	8.00	
10215 Σ+	9.00	
5840 Σ+	10.00	
9085 Σ+	11.00	
4775 Σ+	12.00	
20830 Σ+	13.00	
2nd MEAN	11689.62	Mean
2nd S DEV	7314.83	Standard Deviation
RCL 5	151965.00	Total Number of Larcenies
RCL 7	13.00	Number of Counties

TABLE 1. REPORTED LARCENY BY POPULATION DENSITY FOR THIRTEEN FLORIDA COUNTIES, 1977

COUNTY	POPULATION PER SQ. MILE (X)	REPORTED LARCENY OFFENSES (Y)
Alachua	146	5,740
Duval	748	21,645
Hillsborough	581	25,040
Orange	467	17,920
Polk	151	10,750
Leon	202	5,495
Volusia	206	11,700
Seminole	466	2,930
Escambia	345	10,215
Sarasota	291	5,840
Brevard	252	9,085
Lee	220	4,775
Palm Beach	250	20,830

Source: FBI, UCR, 1978

B. Linear Regression

Discuss the relationship between population density and reported larcenies (See Table 1).

PRESS	DISPLAY	COMMENT
2nd CA	0	
2nd FIX 2	0.00	
146 X⇆Y	0.00	Enter First X Value
5740 Σ+	1.00	Enter First Y Value
748 X⇆Y	147.00	Enter X_2
21645 Σ+	2.00	Enter Y_2
Continue for remaining data points		
220 X⇆Y	253.00	Enter X_{12}
4775 Σ+	12.00	Enter Y_{12}
250 X⇆Y	221.00	Enter X_{13}
20830 Σ+	13.00	Enter Y_{13} (Last Data Point)
2nd MEAN	11689.62	Mean of Y
÷ INV 2nd MEAN	332.69	Mean of X
2nd S. DEV.	7314.83	Standard Deviation of Y
÷ INV 2nd S. DEV.	182.32	Standard Deviation of X
2nd CORR	0.60	Correlation Coefficient
2nd SLOPE	24.24	Slope of Regression Line
2nd Intcp	3626.21	Y-Intercept of Regression Line

C. Trend-Line Analysis

Using the data in Table 2, predict the homicide rate in Chaos City for 1978 and 1980. In what year is the homicide rate likely to reach 100?

PRESS	DISPLAY	COMMENT
[2nd] [CA]	0	
[2nd] [FIX] 4	0.0000	
1967 [X⇆Y]	0.0000	Enter First X_1 Value
12 [Σ+]	1.0000	Enter First Y_1 Value
13 [Σ+]	2.0000	Enter Y_2: Calculator Automatically Increases X Value by One for Each Value Entered
12 [Σ+]	3.0000	
14 [Σ+]	4.0000	
15 [Σ+]	5.0000	
18 [Σ+]	6.0000	
20 [Σ+]	7.0000	
25 [Σ+]	8.0000	
23 [Σ+]	9.0000	
25 [Σ+]	10.0000	
29 [Σ+]	11.0000	1977 Y_{10} Value
[2nd] [CORR] [x^2]	.9298	Coefficient of Determination
1978 [2nd] [y^1]	29.2545	Homicide Rate Estimate for 1978
1980 [2nd] [y^1]	32.7636	Homicide Rate Estimate for 1980
100 [2nd] [x^1]	2018.3212	2018 Estimated Year
[2nd] [SLOPE]	1.7545	Slope
[2nd] [Intcp]	-3441.2365	Y-Intercept

TABLE 2. MURDERS IN CHAOS CITY, 1964 - 1977

YEAR (X)	HOMICIDE RATE (Y)
1967	12
1968	13
1969	12
1970	14
1971	15
1972	18
1973	20
1974	25
1975	23
1976	25
1977	29

Source: Hypothetical Data

III. PROGRAMMING

A. Programming Keys

Develop a program to evaluate the regression equation:

$$Y = 1.7545\ X - 3441$$

PRESS	DISPLAY	COMMENT
[2nd] [CA]	0	
[2nd] [FIX] 2	0.00	
[2nd] [LRN]	00 00	In Learn Mode
[X] 1.7545	07 00	
[=] 3441 [=]	13 00	
[2nd] [R/S] [2nd] [RST]	15 00	
[2nd] [LRN]	0	End of Program
[2nd] [RST]	0.00	Reset to 0
1980 [2nd] [R/S]	32.91	Homicide Rate Estimates for the Period 1980-1985
1981 [2nd] [R/S]	34.66	
1982 [2nd] [R/S]	36.42	
1983 [2nd] [R/S]	38.17	
1984 [2nd] [R/S]	39.93	
1985 [2nd] [R/S]	41.68	

MODULE 6
DATA INTERPRETATION -- SYSTEM

The purpose of Module 6 is to introduce system analysis and obtain knowledge of the types of concepts and related measures used in analyzing the criminal justice system.

The instructor should define carefully, using appropriate examples and illustrations, the new concepts introduced in this module. The Walk-Through illustration of input-output flow analysis should be used to discuss the application of system concepts.

OBJECTIVES - MODULE 6
DATA INTERPRETATION - SYSTEM

1. To describe criminal justice system problems using:

   a. System Concepts
   b. Flow Charts
   c. Descriptive Methods

2. Compare system measures using:

   a. System Concepts
   b. Comparative Methods
   c. Input/Output Flow Analysis

SCHEDULE

DATA INTERPRETATION - SYSTEM

TIME ALLOCATION

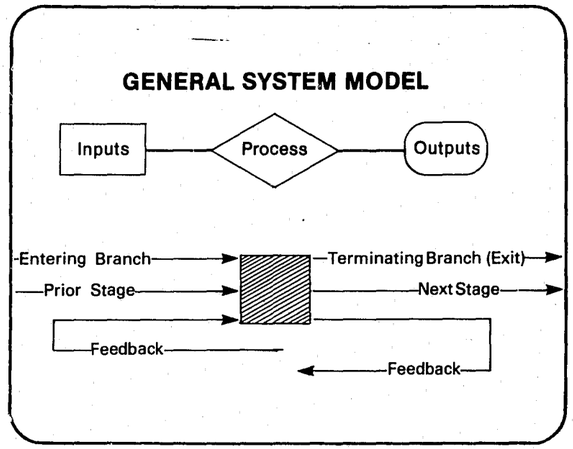
* Less than 5 minutes

NOTES

I. INTRODUCTION

A. What is a System?

SHOW V.A. (6-1):



EMPHASIZE (6-1):

+ A system is "a regularly interacting or interdependent group of items forming a unified whole".
  - Organizational and individual objectives.
  - The environment and fixed constraints.
  - Resources utilized.
  - Components and activities.
  - Performance measures.
  - Administration
  - Dynamic vs static character
  - Input/output model.
+ The generalizable character of this model.

NOTES

+ How it can be "fitted" into most administrative processes either at the "macro" e.g., criminal justice system level, or "micro" level, e.g., police department.

+ Note "feedback" arrows are not connected: feedback may be direct from a particular process or stage or from some other system component.

B. What is the Criminal Justice System?

1. The criminal justice system is a collection of agencies that perform an enormous complex of operations. These activities are organized in a sequential manner in response to the problems created by the commission of criminal acts.

2. The purpose of the criminal justice system is to deal with crime and delinquency. Each component pursues specific objectives which may or may not be consistent with other components of the system.

3. In systems terms, the elements of the criminal justice system are the offender and other individuals who have been arrested for the commission of criminal acts, criminal justice agencies and their personnel, equipment and facilities.

4. External to the system are inputs such as community attitudes toward crime, and public per capita expenditures for the criminal justice system, and related community agencies. Internal inputs include flows of offenders from an entering branch, prior stage or feedback.

   The criminal justice system produces a flow of individuals directed toward a speedy and just disposition. This flow is caused by the criminal acts committed and the calls for service they generate.

NOTES

5. The components of the criminal justice system are interdependent. For example, calls for service and the number of personnel available influence the number of dispatches made. The number of dispatches made, in turn, influences the number of arrests that are made; and the number of arrests made in the law enforcement subsystem provides flow to the judicial subsystem, influencing its workload. Judicial workload, in turn, influences trial dates and consequently, trial times.

6. One way of viewing the criminal justice system, emphasizing its components, is presented in Exhibit 1.

   a. In Exhibit 1, law enforcement, courts and correctional agencies, their personnel and their facilities interact in such a way that responses to criminal acts are made and case flows established.

   b. The agencies, their personnel, facilities, equipment and budgets, as they respond to the offender and his acts, can be considered the primary components of the criminal justice system.

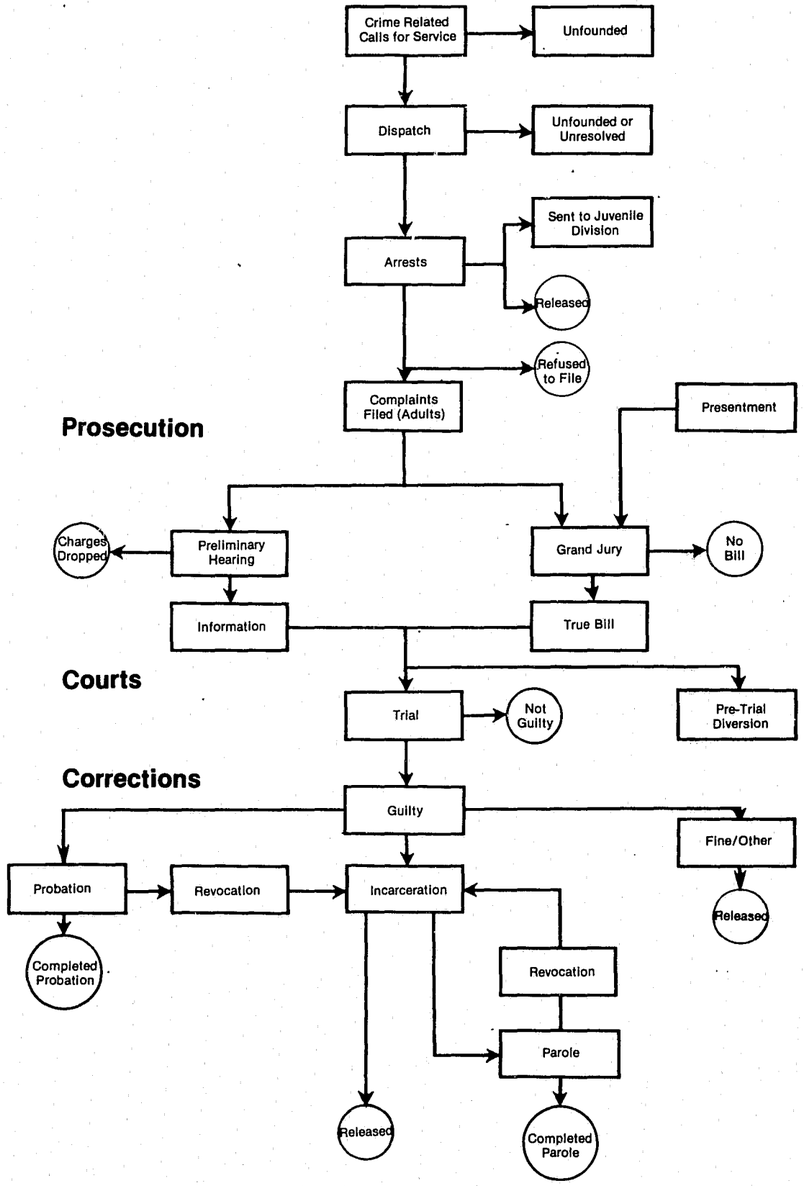
   c. The primary inputs to the system are the criminal acts.

   d. The primary outputs are the offenders, case flows and the time relationships involved in the processing of the individual through the system.

   e. The legal code and statutes, which define crime, and the criminal justice agencies provide the framework for the delivery of criminal justice services.

   f. Suggest how the general system model can be plugged into virtually any point on the Exhibit, and would substantially contribute to beginning to untangle the "dynamic" characteristic of criminal justice.

Exhibit 1. The Criminal Justice System



NOTES

C. How can the Criminal Justice System be Analyzed?

1. The logic and methods developed throughout this course.

   a. Identify and formulate system-specific problems.

   b. Identify and collect related system measures.

   c. Analyze and interpret systems data.

2. System Data includes the following:

   a. Resource measures

   b. Workload and output measures

   c. Capability and capacity measures

   d. Performance measures:

      - Productivity
      - Efficiency
      - Effectiveness

   e. Administrative measures

3. Modules 3, 4 and 5 tools can be applied; new tools are also appropriate.

4. System-Specific Tools to be discussed include:

   a. Flow charts

   b. Input/output flow analysis

D. Overview of Module

1. The first section presents the use and interpretation of flow charts.

2. Walk-Through 'K' illustrates the interpretation of flow charts.

3. The next section defines and illustrates system concepts.

4. This is followed by Walk-Through 'L' which demonstrates how these concepts can be measured and interpreted.

NOTES

II. FLOW CHARTS

A. Uses of Flow Charts

1. Aid to Reader or Audience

2. Concept development and problem clarification device

a. Identify gaps in knowledge

b. Tighten logic

B. Types of Flow Charts

1. Process flow chart

a. Physical flow of offenders from one component to another is shown

b. Exhibit 1. provides an example

2. Operations charts.

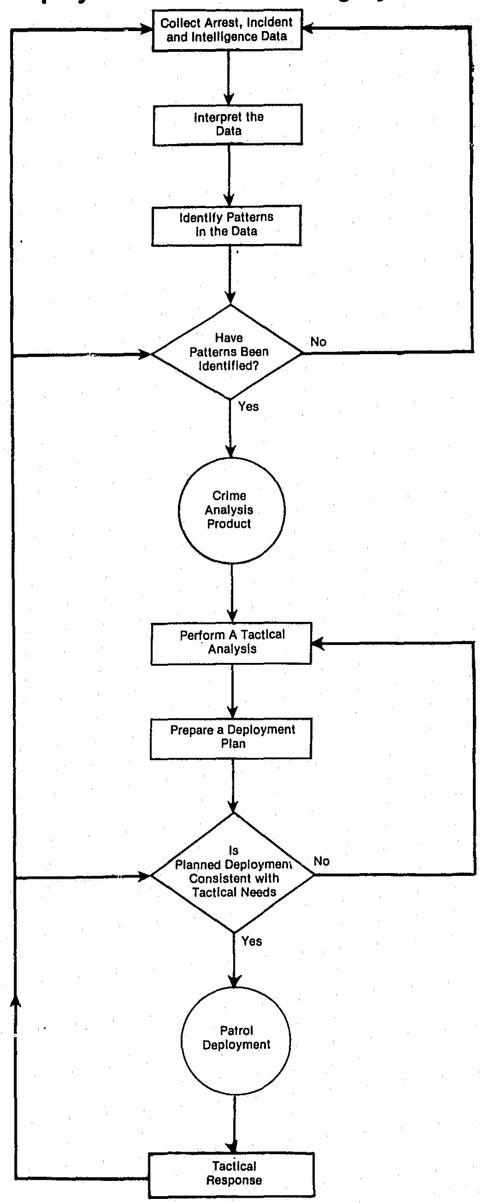
a. Shows essential operational aspects of the system

b. Exhibit 2 provides an example

c. Note that:

- A rectangle should be used to present an instruction or information
- A diamond-shape is used to indicate decision points, or places where choices must be made
- Arrows indicate the direction of the flow
- Circles, ovals, or triangles indicate products or end points in the flow

Exhibit 2. Operations Flow Chart, Deployment Decision-Making System



Source: Chaos City Police Department, 1978.

NOTES

3. Dependency Chains

   a. Portrays a sequence of events

   b. Dependence of various events and not flows is emphasized.

   c. Examples of a dependency chain are the time series charts presented in Module 3, and the PERT Chart to be discussed in Module 8.

4. Organizational Patterns

   a. Exhibit 3 is an organizational chart for Chaos City's Regional Planning Unit.

   b. Relationships and flows of authority and responsibility in an organization

   c. Generally, solid lines are used to indicate authority and responsibility; dotted lines are used to indicate "confer and advise"

5. Convergence/divergence flow charts

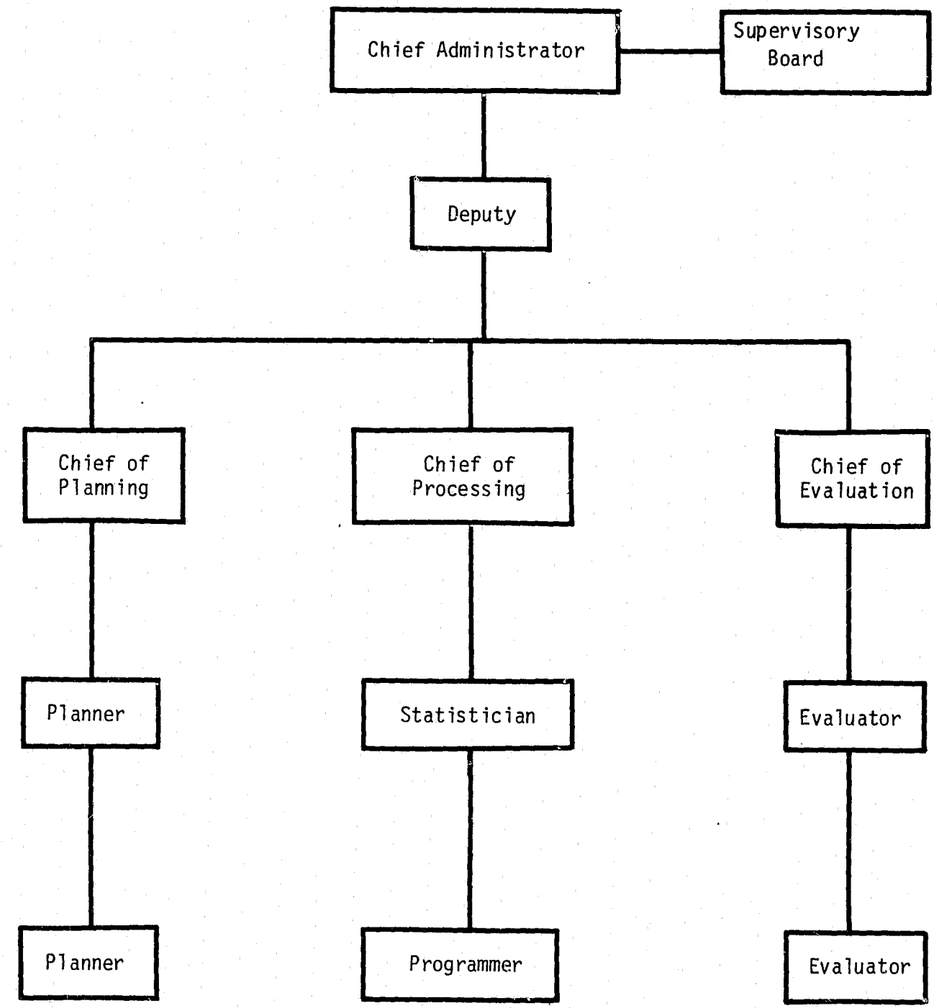
   a. A flow of offenders may diverge or converge leading to one or several outcomes. This is the principle of a disposition tree.

   b. Disposition trees are a type of widely used flow chart in criminal justice

   c. See Exhibit 4 for an example of a disposition tree.

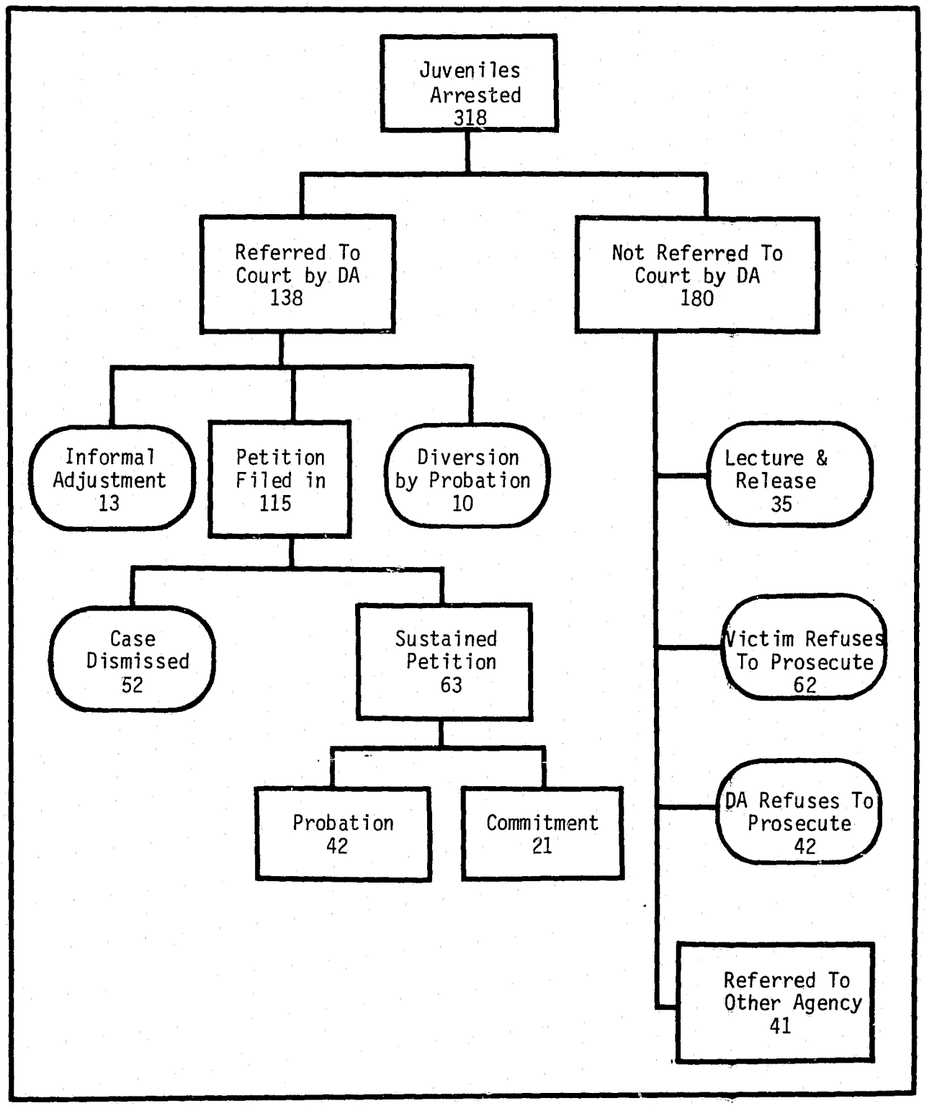
   d. The use and interpretation of various types of disposition trees is covered in the next section.

Exhibit 3. Organizational Chart, Chaos City, Regional Planning Unit



Source: Chaos City, Regional Planning Unit, 1977.

Exhibit 4. Divergence Flow Chart
Assault Arrests (Juveniles Only) Chaos City, 1977



Source: From Exercise #1

PURPOSE

To illustrate the construction, uses, and interpretation of flow charts with related summary tabulations of offender flows.

INSTRUCTOR NOTES

A. Go over the structure and design of a disposition tree (V.A. 6-3).

B. Interpret the disposition with input percentages (V.A. 6-4).

C. Interpret the disposition tree with decision point percentages (V.A. 6-5).

D. Interpret the disposition tree with elapsed time (V.A. 6-6).

E. The time available for this walk-through is 30 minutes.

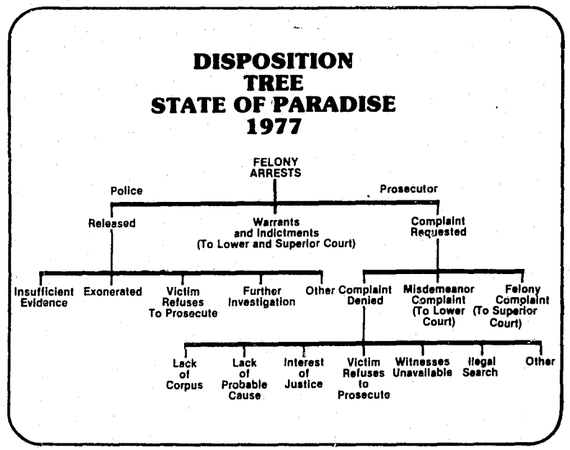
F. Following are four flow charts and three exhibits. The exhibits present two of the flow charts in summary tabulations. The final exhibit, which concludes the Walk-Through, compares the uses of transaction data as presented in the disposition trees, and summary tabulations.

WALK-THROUGH 'K'

DATA SET/WORKSHEET

A. Disposition Tree

SHOW V.A. (6-2):



EMPHASIZE (6-2):

+ The structure and design of the tree. This tree presents the flow of offenders in the State of Paradise for the year 1977.

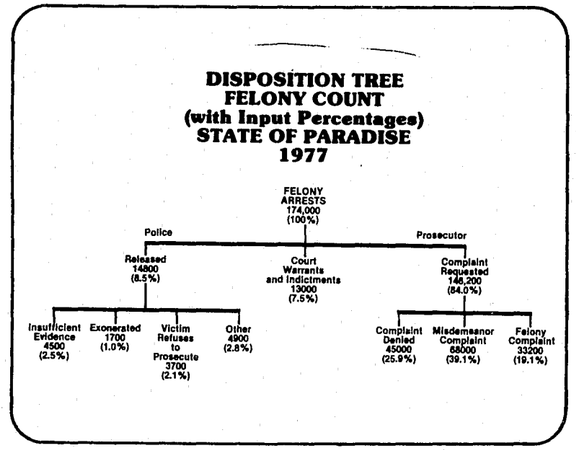
+ Try to anticipate offender flows with participants.

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

B. Disposition tree with input percentages.

SHOW V.A. (6-3):



EMPHASIZE (6-3):

+ Point out that each limb of the tree represents part of the total. A major finding of this particular tree is that felony complaints only account for 19.1% of all felony arrests and that 8.5% of all those arrested are released.

---

1. Table 1 presents a different perspective on the data in V.A. 6-4.

2. Note that (1) data presented are for a single county and not for an entire state; (2) the county data have been subdivided by arresting agencies; and (3) since Agency A accounts for nearly 63% of all dispositions the last column has been added to isolate the remainder of the agencies.

3. Inspection of the table indicates that D & E are similar in performance. This is verified by calculating an r = .94. Comparing Agency A with County Less A results in an r = .66 indicating less similar performance between A and other agencies. Also note that Agency A, while high on law enforcement releases and complaints denied, is quite low on percent convictions.

WALK-THROUGH 'K'

Table 1. Disposition of Felony Arrests
Comparison of State and County Agencies
(With Input Percentages)

	STATEWIDE (56 COUNTIES)	CHAOS COUNTY	COUNTY ARRESTING AGENCIES						COUNTY LESS AGENCY A
			AGENCY A	AGENCY B	AGENCY C	AGENCY D	AGENCY E	AGENCY F	
Total felony arrests dispositions	174,069	19,698	12,351	3,793	1,326	684	506	1,038	7,347
Not convicted - number - (% total)	89,820 (51.6)	11,684 (59.3)	7,622 (61.7)	2,211 (58.3)	676 (51.0)	330 (48.3)	246 (48.6)	599 (57.7)	4,062 (55.3)
• Law enforcement releases	8.5	13.9	(20.1)	0.7	8.6	7.3	6.7	5.3	2.6
• Complaints denied	25.9	13.1	(14.9)	11.0	18.0	17.0	14.8	8.7	11.4
• Lower court	14.4	32.1	24.4	44.3	22.9	22.5	24.9	43.2	35.9
• Superior court	4.0	.2	2.3	2.3	1.5	1.5	2.2	0.5	2.3
Convicted - number - (% total)	84,249 (47.2)	8,014 (40.7)	4,729 (38.2)	1,582 (41.7)	650 (49.0)	354 (51.7)	260 (51.3)	439 (42.4)	3,285 (54.7)
• Lower court	28.0	24.6	(19.6)	27.1	35.0	33.7	28.0	33.3	30.8
• Superior court	19.2	16.1	(18.6)	14.6	14.0	18.0	23.3	9.1	17.0

Source: Chaos County, 1977.

r = .94

r = .66

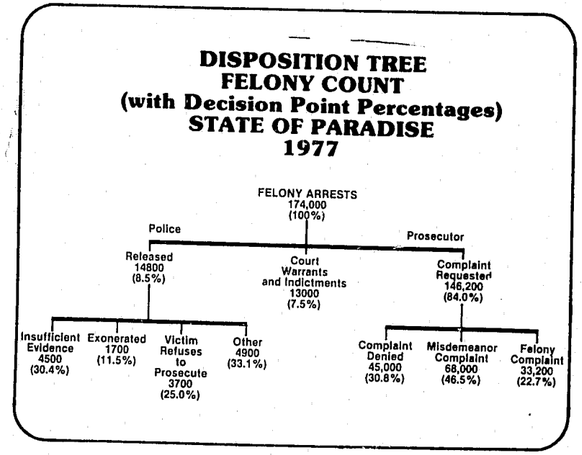
VI-17-IG

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

C. Disposition tree with decision points.

SHOW V.A. (6-4)



EMPHASIZE (6-4):

+ Note how this format focuses attention on specific components of the decision, e.g., indicates the consequences of certain decisions made by the prosecutor.

+ When compared to the input percentage table, this chart indicates that, of the cases handled by the prosecutor, the felony complaint problem is more of a problem than was indicated by input percentages alone.

+ This format also emphasizes the relative importance of insufficient evidence as a reason for police release.

---

1. Table 2 presents the county level data on Law Enforcement releases.

2. Note in Agency B and E the comparatively high percentage of exonerated arrestees. Agency A is much different from the remainder of county ($r = .51$).

3. When law enforcement releases are compared with total arrest disposition A = 20% versus B = less than 1% and a statewide average of 8.5% (from Table 1).

Table 2. Disposition Of Felony Arrests/Comparison of County Agencies (With Decision Point Percentages) Chaos County - 1977

DISPOSITION	CHAOS COUNTY	SELECTED COUNTY ARRESTING AGENCIES						COUNTY LESS AGENCY A
		AGENCY A	AGENCY B	AGENCY C	AGENCY D	AGENCY E	AGENCY F	
Total felony arrest dispositions. . .	19,698	12,351	3,793	1,326	684	506	1,038	7,347
Law enforcement releases.	2,757	3,482	27	114	50	34	32	257
• Insufficient evidence	76.4	81.9	22.2	32.5	56.0	5.9	0.0	35.4
• Exonerated.	0.8	0.3	7.4	4.4	0.0	8.0	31.3	4.3
• Victim refuses to prosecute . . .	12.6	12.3	7.4	20.2	16.0	2.9	28.1	14.3
• Further investigation	3.7	3.5	3.7	9.6	6.0	0.0	40.6	5.8
• Unspecified, other.	6.5	2.0	59.3	33.3	22.0	82.4	0.0	40.0

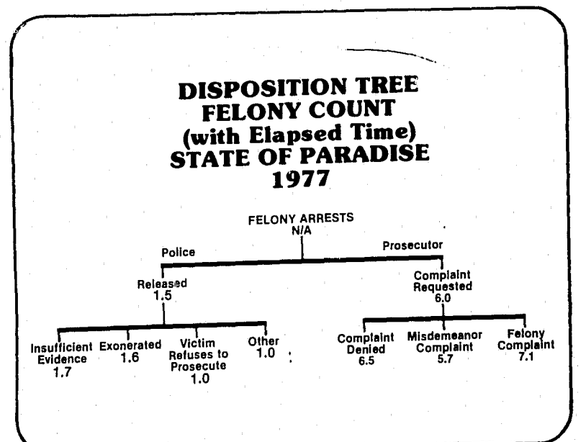
Source: Chaos County, 1977.

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

D. Disposition tree with elapsed times.

SHOW V.A. (6-5):



EMPHASIZE (6-5):

+ This format present for each limb, average elapsed time from point of arrest to each specific type of disposition.

+ Time is measured in days and includes weekends.

+ As a standard, you may consider any elapsed time of more than 4 1/2 days a serious problem. Thus prosecutor releases and insufficient evidence stand out as issues warranting further investigation.

E. Limits and uses of transaction data and summary tabulations. Table 3 concludes the Walk-Through.

DATA SET/WORKSHEET (Continued)

Table 3. Uses Of Transaction Statistics/Disposition Trees

SUMMARY

* Traces the flow of offenders through the criminal justice system.
* Aids in developing explanations of the observed characteristics of where backlogs occur.
* Permits measurement of the recirculation of offenders.
* Helps in performing input-output analysis.
* Helps in monitoring the system.

LIMITS OF SUMMARY TABULATIONS

* Can not be used to identify the impact of system changes.
* Can not be used to elaborate the process or "dynamic" aspects of the criminal justice system.

WALK-THROUGH 'K'

NOTES

III. SYSTEM CONCEPTS

This section is to be presented in the manner of a group discussion with the instructor initiating the presentation of each concept and with subsequent group additions and expansions of definitions and examples. The instructor should provide an appropriate illustration for each concept.

A. Overview of System Concepts

1. Administration and environment are difficult concepts to measure.

2. Yet system operations is critically influenced by and influences both.

3. The following discussion will first consider definitions of: 1) the environment and 2) administration. Next will be a discussion of eight system operations concepts. Finally there is a comprehensive illustration of how these concepts can be applied to system problems.

B. Environment

Refer to Exhibit 5, define the concept, and discuss how it may be applied.

C. Administration

Refer to Exhibit 6 and discuss the definition, examples and applications.

D. Systems Operations

Exhibits 6 through 13 present concepts of systems operations. Each of the following concepts should be defined and described in general about application:

- Resources (Exhibit 7)
- Workload (Exhibit 8)
- Productivity (Exhibit 9)
- Efficiency (Exhibit 10)
- Effectiveness (Exhibit 11)
- Capability (Exhibit 12)
- Summary of Concepts (Exhibit 13)

Exhibit 5. Environment

I. CONCEPTUAL DEFINITION:

External Influences on the criminal justice system. Measures of crime and community characteristics which affect and are affected by the criminal justice system.

II. EXAMPLES:

Community Characteristics	Crime Characteristics
Population	Type
Population Change	Volume
Population Density	Rate
Percent Black Population	Offender Characteristics
Percent Juvenile Population	Victim Characteristics
Percent Households Receiving Aid to Families with Dependent Children	Crime Characteristics
Unemployment Rate	
Juvenile Population	
Attitudinal Measures	

III. DISCUSSION:

- The environment places constraints on the range and type of system responses to crime:

  --Defines the overall mission of the system

  --Changes in public attitudes toward offenders
  example: "punishment" vs. "rehabilitation"

- The environment provides external inputs to the system which impacts system and agency administration.

Exhibit 6. Administration

I. CONCEPTUAL DEFINITION:

Organization, management and operations of the criminal justice system, components and agencies. Measures of management, organization and operational characteristics of an agency.

II. EXAMPLES:

- Agency Goals and Objectives
- Agency Policies and Procedures
- Agency Organization
- Personnel Skill and Training Level

III. DISCUSSION:

- Administrative decision-making can critically influence system operations by changing: goals and standards; resources and workloads; and the organization and procedures used.
- Environment, administration and system operation are interdependent and interactive.

Exhibit 7. Resources

I. VARIABLE DEFINITION:

Means available to process workload through the criminal justice system or its components.

II. MEASURES RELATED TO:

Budgets, personnel, equipment and facilities.

Measures of:

Police	Prosecutors	Courts	Corrections
Officers	Attorneys	Judges	Officers
Weapons	Clerks	Courtrooms	Institutions
Vehicles	Office Equipment	Clerks	Equipment
Office Equipment	Time	Equipment	Budget
Budget	Budget	Time	Time
Time		Budget	

III. DISCUSSION

When measuring resource levels, distinguish between:

- Staff resources (clerks, etc.) and operational resources (detectives)
- Capital expenditures and operating expenditures
- Fixed costs and variable costs
- Direct and indirect costs

Exhibit 8. Workload/Output

I. VARIABLE DEFINITION:

Work to be processed through the criminal justice system or its components within a specific time period.

II. MEASURES RELATED TO:

Type, amount and importance of work to be processed in a specified period of time.

Measures of (weekly):

Police	Prosecutor/Courts	Corrections
Calls for Service	Cases	Pre-Sentence Investigations
Arrests	Hearings	Probationers Supervised
Criminal Investigations	Filings	Parolees Supervised
Court Appearances		Inmates Supervised

III. DISCUSSION

Generally, workload measures cannot be directly compared between system components since the measures vary between agencies.

A related concept is "output" which can be defined as the number of workload units which are processed/produced at the end of a specified time period.

Output measures are stated in the past tense while workload measures are stated in the future tense. For example, a workload measure for the court is "cases to be tried next week;" restated as an output measure--"cases tried last week."

Exhibit 9. Productivity

I. VARIABLE DEFINITION:

The amount of work that can be produced/processed with specified resources in a given period of time.

II PRODUCTIVITY DERIVED BY:

Comparing workload (or output) and resource measures over a specified period of time. Productivity is usually expressed as a rate,

$$P = \frac{W}{R} \text{ or } \frac{O}{R}$$

P = Productivity Measure
W = Workload Measure
R = Resource Measure
O = Output Measure

Exhibit 10. Efficiency

I. VARIABLE DEFINITION

Generally, the ratio of workload to output. Efficiency measures are usually expressed as a percentage or as a percent change and in directional or comparative terms, i.e., more, less, the same.

II. EFFICIENCY DERIVED BY:

Comparing workload and output between comparable components, e.g., prosecutor offices around the state, or across time, e.g., week to week.

$$E = \frac{O}{W}$$

E = Efficiency
O = Output
W = Workload

III. DISCUSSION

A. Efficiency and productivity need to be clearly distinguished by emphasizing the use of resources in deriving measures of productivity.

B. Efficiency measures invite simplistic comparisons subject to significant measurement error.

Exhibit 11. Effectiveness

I. VARIABLE DEFINITION:

Generally, the extent to which the system (or its components) achieves or exceeds its goals and objectives.

II. EFFECTIVENESS DERIVED BY:

Comparing planned output (or a standard) to the output achieved. Measures of effectiveness are usually expressed as rates or percentages.

$$E_f = \frac{\text{Output}}{\text{Planned Output (or Standard)}}$$

E_f = Effectiveness

III. DISCUSSION:

Effectiveness measures are often difficult to estimate since goals and objectives are often qualitative and not amenable to quantification.

Exhibit 12. Capability

I. VARIABLE DEFINITION:

The expected level of output for the system (or a component) at a planned or standard level of productivity with a specified amount of resources in a given time period.

II. CAPABILITY DERIVED BY:

Calculating the products of a specified productivity objective or standard and resources.

C = R X Ps
C = Capability measure
R = Resource measure
Ps = Productivity standard or objective

III. CAPACITY

A. A related variable is "capacity" which is defined as the potential output of the system (or a component) when productivity is maximized with a specified level of resources in a given time period.

Cap = R X P*
Cap = Capacity
R = Resource
P* = Maximum Productivity

Exhibit 13. Summary of System Concepts and Variables

I. ENVIRONMENT:

What factors outside the system affect the system?

II. ADMINISTRATION:

How is the work to be organized and managed? What are the objectives and standards?

III. SYSTEM OPERATIONS:

A. Resources: What is available to work with?

B. Workload: What is to be done?

C. Performance: What are the results?

1. Output: What has been done?
2. Productivity: How costly in resources are the system results?
3. Efficiency: How much of the work to be done is done?
4. Effectiveness: How does the result compare to goals, standards, objectives or estimates?

D. Capability/Capacity: How much work can be done in a specified time with given resources?

FLOW ANALYSIS

PURPOSE

This Walk-Through illustrates input/output flow analysis and clarifies the system concept definitions. It also demonstrates the relationships between system concepts; demonstrates how to measure and interpret the system operation concepts.

INSTRUCTOR NOTES

A. In introducing the Walk-Through, cover the following:

1. This is an example of input/output analysis utilizing system concepts and measures.

2. Specifically, this is a court example--the same method and procedure could be applied to other components of the criminal justice system.

B. Examine Table 1 - Input/Output Flow Model

1. Describe system model

a. Input-workload

b. Process-court trials

c. Output-final dispositions

d. Feedback-backlog

2. Point out concerns about:

a. backlog

b. low number of convictions

3. Walk-Through will analyze backlog problem and assess strategies to reduce court backlog

C. Measuring System Concepts (Section A-E of Data Set and Worksheet)

1. Analysis of problem (backlog) will be accomplished using system concepts and their related measures.

INSTRUCTOR NOTES (Continued)

2. Point out that the critical resources are time and judges for the backlog problem.

3. Discuss each measure in the data set (Sections A - E) referring to the flow model (Table 1) when appropriate.

4. In discussion, reiterate concept definitions relating them to measures: emphasize the derived nature of most of the measures.

5. Indicate that productivity, efficiency and effectiveness are three different measures of performance.

6. Key formulas and calculations should be placed on newsprint or on overheads to help participants expedite and maintain the continuity of the walk-through.

D. Analyzing System Data (Sections F-J of Data Set and Worksheet)

1. State problem in system terms, for example, convert more workload to outputs, try more cases. There are two extreme strategies

2. Strategy #1 - if productivity is fixed, then resources must be increased:

a. To deal with backlog, judge resources must be increased.

b. Strategy implies an increase in court budget and capacity.

3. Strategy #2 - if resources are fixed, then productivity must be increased to take care of backlog problem.

a. This strategy requires that actual productivity must be increased.

b. Use of productivity objectives or standards are an important aspect to this strategy.

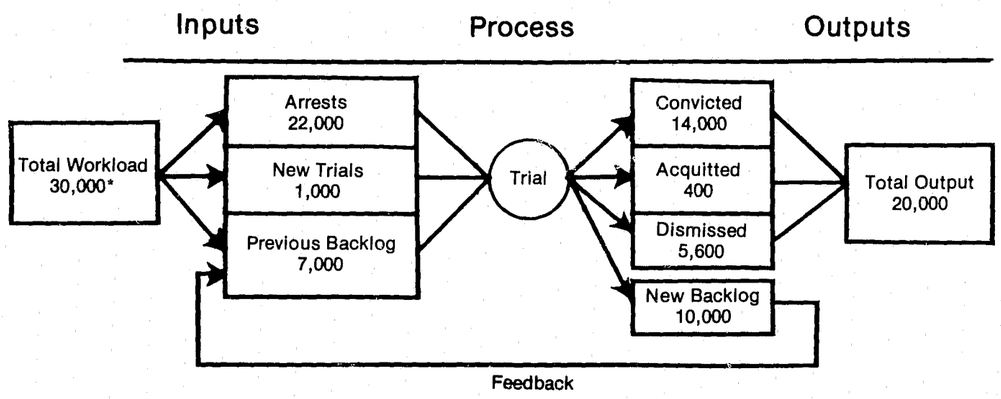
c. This strategy implies cases must be tried in less time - which has implications for the quality of justice and fairness of the process.

d. Key to this analysis is making participants aware of how the concepts help to structure the problem and how many system problems involve difficult tradeoffs--in this case between resources and equity.

4. Explain Table 2 to participants and discuss the tradeoffs made in determining an appropriate mix of strategies.

E. Time available for this Walk-Through is 40 minutes.

Table 1. Input/Output Flow Model



*All measures are "cases"

WALK-THROUGH 'L'

DATA SET/WORKSHEET

A. Resources

1. 15 Judges
2. 1,600 Hours/Judge/Year
3. 24,000 Judge/Hours/Year
4. $6.5 Million Budgeted
   $6.0 Million Expended

B. Workload/Output

1. Workload is 30,000 Cases/Year

2. Output is 20,000 Cases/Year

C. Productivity

1. Based on Workload Measures

a. 2,000 cases per judge per year required to meet existing workload

$$P_1 = \frac{W}{R} = \frac{30{,}000 \text{ Cases/Year}}{15 \text{ Judges}} = 2{,}000 \text{ Cases/Judge Year}$$

b. 1.25 judge hours per case required to meet existing workload

$$P_2 = \frac{R}{W} = \frac{24{,}000 \text{ Judge-Hours/Year}}{30{,}000 \text{ Cases/Year}} = .8 \text{ Judge-Hours/Case (48 minutes)}$$

2. Based on Output Measures

a. 1,333 Cases/Judge were tried last year.

$$P_3 = \frac{O}{R} = \frac{20{,}000 \text{ Cases}}{15 \text{ Judges}} = 1{,}333 \text{ Cases/Judge}$$

b. $300 per Trial

$$P_4 = \frac{R}{O} = \frac{\$6.0 \text{ Million}}{20{,}000 \text{ Cases}} = \$300/\text{Case}$$

c. 1.2 Judge-Hours per Case (72 minutes)

$$P_5 = \frac{R}{O} = \frac{24{,}000 \text{ Judge-Hours/Case}}{20{,}000 \text{ Cases/Year}} = 1.2 \text{ Judge-Hours/Case}$$

D. Efficiency

1. Based on Time Series Comparison

Year	72	73	74	76	77
Workload	28,000	28,500	28,200	29,100	30,000
Output	15,000	14,000	15,050	16,000	20,000

a. $E_{77} = 66.6\% = \frac{\text{Output}}{\text{Workload}} = \frac{20{,}000}{30{,}000} \times 100$

$E_{72} = 53.5\% = \frac{\text{Output}}{\text{Workload}} = \frac{15{,}000}{28{,}000} \times 100$

b. $\frac{66.6 - 53.5}{53.5} = 24.5\%$ improvement in percentage of cases processed in the past five years.

2. Based on inter-agency comparison

	Chaos Court	State Mean*
Workload	30,000	13,000
Output	20,000	11,000

*Based on calculated mean workload and output of 15 criminal courts in the State of Paradise during 1977 (excluding Chaos City)

a. $E_{Chaos} = \frac{\text{Output}}{\text{Workload}} = \frac{20{,}000}{30{,}000} = 66.6\%$

$E_{State} = \frac{\text{Output}}{\text{Workload}} = \frac{11{,}000}{13{,}000} - 84.6\%$

b. $E = \frac{66.6 - 84.6}{84.6} = -21.3\%$

Chaos' Trial Court in 1977 processed 21.3% less of its workload than did the other 15 trial courts in the State.

E. Effectiveness

1. Based on an objective of processing 24,000 cases, the court was 83.3% effective:

$$E_f = \frac{20{,}000 \text{ Cases (Output)}}{24{,}000 \text{ Cases (Planned Output)}} \times 100 = 83.3\%$$

WALK-THROUGH 'L'

2. Based on an objective of not increasing the backlog of 7,000 cases, the court was 42.8% ineffective:

$$E_f = \frac{\text{Output (Later Period)} - \text{Output (Earlier Period)}}{\text{Planned Output}} \times 100$$

$$E_f = \frac{\text{10,000 Case Backlog} - \text{7,000 Case Backlog}}{\text{7,000 Case Backlog}} \times 100$$

$$E_f = 42.8\%$$

F. Capability

1. Assuming a productivity standard of 1,800 Cases/Judge/Year one measure of the court's capability would be 27,000 Cases/Year.

$C_1 = R \times PS = 15 \text{ judges} \times 1{,}800 \text{ Cases/Judge} = 27{,}000 \text{ Cases}$

2. Assuming a productivity standard of $275/Case, a second measure of court capability would be 23,636 cases.

$C_2 = R \times PS = \$6{,}500{,}000 \times \$275/\text{Case} = 23{,}636 \text{ Cases}$

3. Assuming a productivity standard of 1 Judge-Hour/Case, a third measure of capability would be 24,000 cases.

$C_3 = R \times PS = 24{,}000 \text{ Judge-Hours} \times 1 \text{ Judge-Hour/Case} = 24{,}000 \text{ Cases}$

G. Capacity

The minimum case cost during 1977 was determined to be $210 and this figure is assumed to be a reasonable indicator of maximum productivity. Assuming a maximum productivity of $210 per case, 30,952 cases could be processed.

$CAP = R \times P^* = \$6{,}500{,}000 \times \$210/\text{Case} = 20{,}952 \text{ Cases}$

H. Determining Resource Requirements Based on Fixed Performance Standards

1. The number of Judge-Hours required to meet existing workload is 36,000 Judge-Hours.

$$R_1 = \frac{\text{Workload}}{PS} = \frac{\text{30,000 Cases}}{\text{1.2 Judge-Hours/Case}} = 36{,}000 \text{ Judge-Hours}$$

2. The total number of judges required to meet existing workload assuming a productivity standard of 1,600 Hours/Judge/Years is 22.5 judges.

$$R_2 = \frac{R_1}{PS} = \frac{36{,}000 \text{ Judge-Hours}}{1{,}600 \text{ Judge-Hours/Judge}} = 22.5 \text{ Judges}$$

3. Therefore, 7.5 additional judges are required to meet the existing workload.

4. This requires a resource increase of 50% in the number of judges.

$$R_3 = \frac{R \text{ (Required)} - R \text{ (Existing)}}{R \text{ (Existing)}} \times 100$$

$$R_3 = \frac{22.5 - 15}{15} \times 100 = 50\%$$

I. Determining Productivity Objectives Assuming Fixed Resources

1. To process the existing workload each judge would need to process 2,000 cases.

$$PS = \frac{W}{R} = \frac{\text{30,000 Cases}}{\text{15 Judges}} = 2{,}000 \text{ Cases/Judge}$$

2. A similar productivity objective would be 48 Judge-Minutes per case.

$$PS = \frac{R}{W} = \frac{\text{1,600 Judge-Hours}}{\text{2,000 Cases}} = 48 \text{ Judge-Minutes/Case}$$

3. This represents over a 50% increase in productivity required to meet the existing workload.

$$\frac{P - PS}{PS} \times 100 = \frac{75-48}{48} \times 100 = 56.25\%$$

WALK-THROUGH 'L'

J. Comparative Analysis of Two Strategies for Reducing Court Backlog

1. Strategy 1--increase number of judges (increase resources)

   If productivity remains 1.2 Judge-Hours per case and resources are increased to 22.5 judges, the court backlog will be reduced to zero.

2. Strategy 2--reduce average time per case (increase productivity)

   If resources remain at 15 judges and productivity is increased to 48 Judge-Minutes per case, court backlog will be reduced to zero.

3. The following table allows comparison of these two strategies. The numbers inside the table represent court backlogs at varying levels of court productivity and resource.

DATA SET/WORKSHEET (Continued)

Table 2. Comparing Changes in Resources and Productivity

Productivity (Judge-Minutes/Case)	Resource (Number of Judges)				
	15	17	19	21	23
72	10,000*	7,333*	4,666	2,000	0
62	6,774	3,677	580	0	0
52	2,308	0	0	0	0
42	0	0	0	0	0

* Existing Backlog = Workload - $\frac{(R_1 \times R_2)}{P}$

10,000 cases = 30,000 cases - $\frac{(15 \text{ judges} \times 96{,}000 \text{ Judge-Minutes/Year})}{72 \text{ Judge-Minutes/Case}}$

** Estimated Backlog = Workload - $\frac{(R_1 \times R_2)}{P}$

Estimated Backlog (given 17 Judges and 72 Judge-Minutes/Case = 30,000 Cases - $\frac{(17 \text{ Judges} \times 96{,}000 \text{ Judge-Minutes/Year})}{72 \text{ Judge-Minutes/Case}}$

Estimated Backlog = 7,333 Cases

WALK-THROUGH 'L'

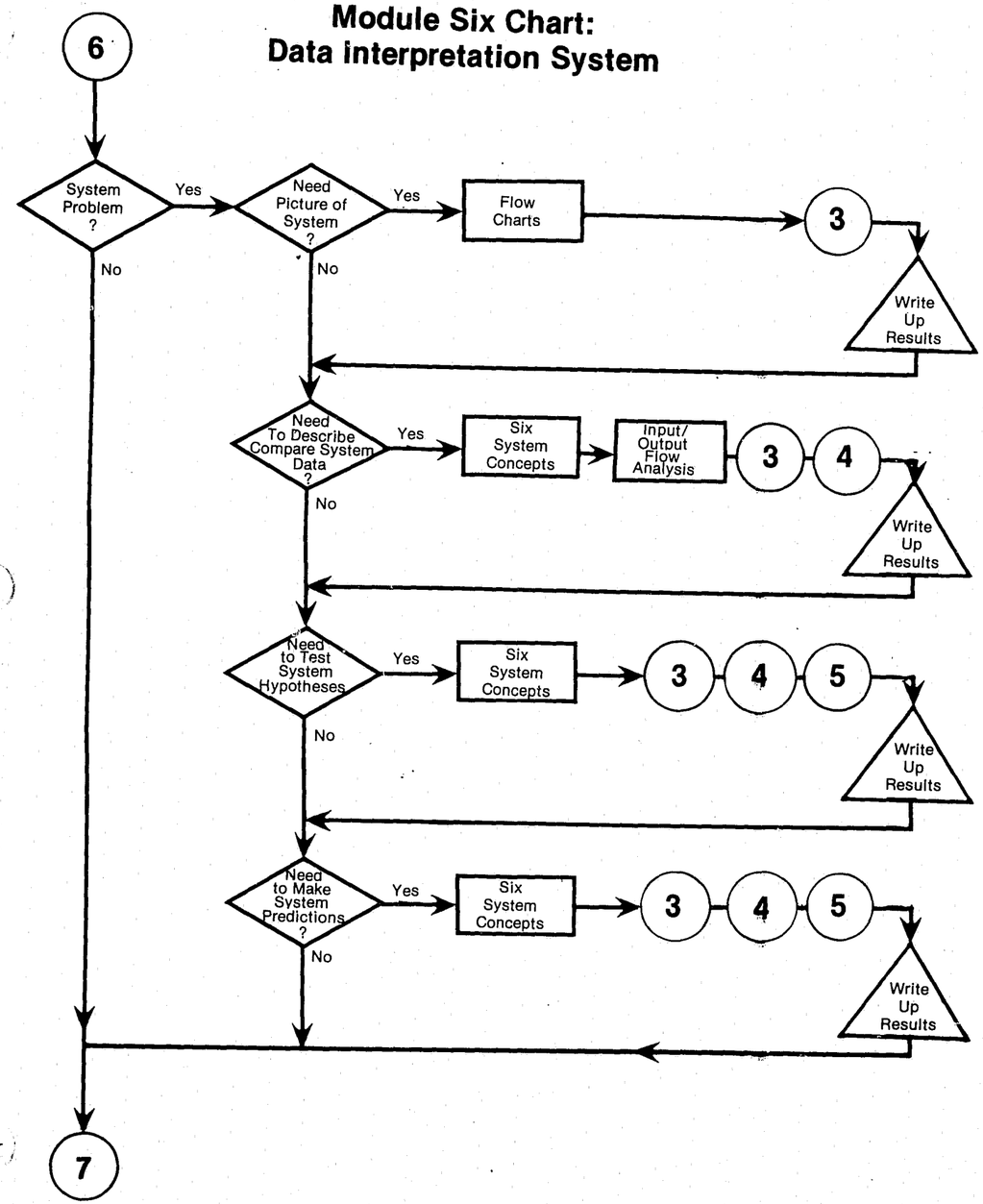
NOTES

V. CONCLUSION

Review the Module Chart.

Indicate Module 6 - Systems Methods develops the use of descriptive, comparative and inferential methods on system's problems.

SHOW V.A. (6-6):



Module 7

MODULE 7
PRESENTATION OF FINDINGS

This module suggests methods of making effective presentations both written and orally before an audience. Although the lecture is relatively brief, its importance cannot be stressed enough since all the products of analysis are useless if they are not persuasively presented to the proper individuals and organizations.

The lesson is divided into three segments: an introduction which includes a technical checklist of the major topics necessary for sound analysis; a discussion of the importance of understanding the roles, motivations, and purposes of the various actors, including the analyst, in criminal justice decision-making; and finally, a list of guidelines for making stronger presentations.

This module should last no longer than 80 minutes. The instructor should take care throughout the presentation to provide guidance to participants for their presentations required in the Major Exercise. Following this module participants will have an opportunity to complete their problem statements and prepare their presentations which will take place on Friday morning.

OBJECTIVES - MODULE 7
PRESENTATION OF FINDINGS

1. To develop a sound perspective on criminal justice problems using:

   a. Knowledge about the roles of principal participants and concerned parties

   b. Audience information.

2. To develop a complete and effective presentation by:

   a. Using presentation guidelines.

   b. Following an analysis report format.

   c. Using appropriate briefing materials and taking care to develop an effective presentation manner.

   d. Recognizing the interdependence of technical preparation and proper perspectives in making presentations that influence decisions.

SCHEDULE

PRESENTATION OF FINDINGS

TIME ALLOCATION

* Less than 5 minutes

NOTES

I. CONSIDERATIONS IN PREPARING PRESENTATIONS

A. Preparation

1. When presentations are not properly prepared, essential facts and messages are either destroyed or lost.

2. Presentation should be considered a "selling of products", not just a "problem statement."

B. Responsibilities

1. Analyst or presenter must be certain the information is transmitted clearly, and succinctly.

2. It should also be in a form that is meaningful to the audience/reader.

C. Cautions

1. Because of brief audience interest span, if a presentation is rambling or confusing, most of the audience will "turn off."

2. With rare exceptions most of the problems that fall on the analyst's desk are not purely "criminal justice" in nature.

3. Rather, they are complex issues that touch and concern many other things:

   a. Other "systems"

   b. Other "problems"

   c. Other people

D. Presentation Objectives

1. Develop in your problem statements a sense of the "larger picture," -- the concerns of your audience.

2. The problem or issue should be separated into two essential parts:

   a. The nature of the issue.

   b. Authority of the audience.

3. The presentation should answer the following questions:

   a. Why is the problem important?

   b. What areas can the decision-makers effectively devote their attention to?

4. Efforts need to be expended to overcome the major barriers to effective presentations:

   a. Inadequate data/information.

   b. Inadequate tools.

   c. Limitations of time.

   d. Staff skills.

5. "Refinement" should be considered as a continuous process; however, the reality of today's world is that frequently public decisions are rarely based on any sophisticated "analysis" but rather on other things:

   a. Conventional wisdom.

   b. Distorted and/or untested data/information.

E. Technical Checklist.

SHOW V.A. (7-1):

Technical Checklist

- ✓ Is there a well-stated conceptual foundation for the problem statement?
- ✓ Have the critical hypotheses been selected?
- ✓ Are the variables and measures reliable and valid?
- ✓ Are the statistical techniques used appropriately?
- ✓ Are the data used effectively and interpreted correctly?

EMPHASIZE (7-1):

+ Conceptual foundation is the first building block of a well-stated problem.

  (1) Clarity
  (2) Directly related to audience's concern(s)

+ The hypotheses should directly relate to concepts and should exhibit the characteristics identified in Module 1:

  (1) Measurable
  (2) Accurate
  (3) Testable
  (4) Importance

+ The measures selected should be:

  (1) Reliable
  (2) Valid
  (3) Carefully qualified in terms of definitions and potential sources of measurement error.

+ The statistics used should be:

  (1) Correctly Selected
  (2) Properly Interpreted
  (3) Useful to Reader/Audience

+ The final problem statement should meet all the above, as well as covering the problem statement characteristics--magnitude, spatial aspect of the problem, etc., (See Module 1).

II. ACHIEVING PERSPECTIVE

If all the aspects of the technical checklist are complete and well-done, only 1/2 the analyst's job is done.

A. Role of Elected Politicians

SHOW V.A. (7-2):

THE ROLE BEHAVIOR OF ELECTED POLITICIANS

- Pragmatic, not ideological
- Committed to election and reelection
- Avoid, ameliorate, or resolve conflict by:
  - anticipating reactions
  - manipulating symbols
  - simplifying issues
  - personalizing and particularizing issues
  - promising solutions for the insoluble

EMPHASIZE (7-2):

+ Politicians tend to have a practical orientation.

+ They work under a crisis mandate often.

+ Emphasis from the analyst's perspective must be to communicate influence.

B. Role Behavior of Private Citizens.

SHOW V.A. (7-3):

ROLE BEHAVIOR OF PRIVATE CITIZENS

- Increased Costs
- Impact on Community
- Response to Concerns (Real and/or Imagined)

EMPHASIZE (7-3):

+ Interest groups form in response to concerns.

+ Analyst needs to be sensitive to perceptions, and not just facts.

+ Problem statement should be prepared with cost and impact criteria explicit.

+ Methods of Communicating Concern

  a. Letters to Editor/Politicians

  b. Public Hearings

  c. Other Less Formal Methods

C. Role Behavior of Administrators

SHOW V.A. (7-4):

ROLE BEHAVIOR OF CRIMINAL JUSTICE ADMINISTRATORS

- Accountable for programs.
- Delegate authority.
- Protect turf.
- Not rewarded for efficiency.
- Get it in writing.

EMPHASIZE (7-4):

+ Administrative Accountability for Funds and Programs

+ Need for Delegating Authority

+ Lack of Incentives for Efficiency

+ Problem statements should reflect attention to programmatic aspects of the concern. Attention must be given to the measures most amenable to interventions.

D. Role of Analyst

SHOW V.A.(7-5):

OPTIMAL ROLE BEHAVIOR OF ANALYST

- Objective
- Realistic
- Flexible
- Sensitive
  - — Politics
  - — Emotional Issues
- Future Oriented

EMPHASIZE (7-5):

+ Need for care and attention to detail, e.g., edit fully--numbers, writing, labels.

+ Must anticipate and be proactive -- a "problem seeker" as well as responsive to circumstances.

III. GUIDELINES FOR EFFECTIVE PRESENTATIONS

A. Uses

1. Guidelines can serve as an instrument to minimize major mistakes.

2. Improved presentations can be an effective medium for communication between the analyst and decision-maker.

B. Guidelines

SHOW V.A. (7-6):

PRESENTATION GUIDELINES

1. Emphasize Priority Message
2. Clarify and Interpret Finding by
   - Using Contrasts and Comparisons
   - Using Illustrations and Examples
3. Anticipate Questions, Problems, Assumptions Your Audience
4. Use Terms Important to the Audience

EMPHASIZE (7-6):

+ Stick to priority message. An analyst simply cannot hope to impart all the information collected and interpreted. Rather the analyst should select and develop those priority messages which are of major importance to the decision-maker. He should include the minor issues in his references which may be part of the supportive materials.

+ Decision-makers have limited time to devote to the task of listening to staff reports and studies, regardless of the critical nature of the problem and painstaking analysis.

+ If the analyst doesn't maximize this opportunity, it will leave the audience with a blurred impression or, even worse, outright incorrect impressions.

NOTES

C. Clarification and Interpretation

1. The audience should be aware at the end of a presentation what the problem actually means to them.

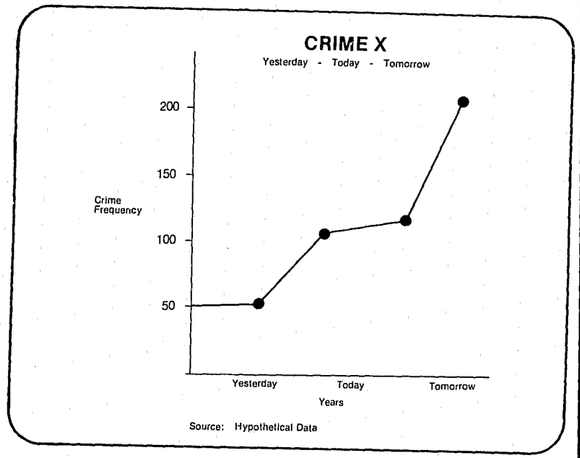
2. If, through research, the analyst is reasonably informed as to the audience's level of awareness, the presented materials should have some context that will reinforce both interest and memory.

3. Avoid over-interpreting the data.

4. Avoid, as well, too much data.

NOTES

SHOW V.A. (7-7):



EMPHASIZE (7-7):

+ Problem statements should provide, if possible, a sense of the past, present, and future.

  (1) What is the history of the problem?

  (2) What is the current problem?

  (3) What might be the result of inaction?

NOTES

D. Use Contrasts and Comparisons

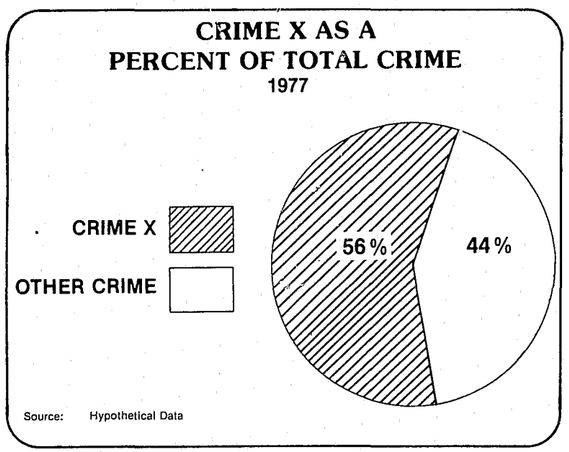
1. Reinforce the context of the presentation, by comparing the problem with knowledge the audience already has.

2. This consideration is particularly important when the messages are new and innovative.

3. Comparison also helps the audience more clearly envision the possible effects or results.

E. Use Illustrations and Examples

SHOW V.A. (7-8):



EMPHASIZE (7-8):

+ Make the message convincing by stressing pertinent facts.

+ Hold attention and focus it.

+ Avoid tangled logic.

+ Use contrasts, comparisons, and analogies.

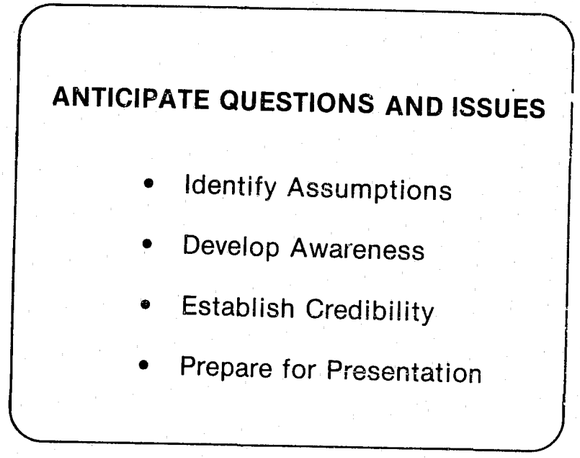
NOTES

+ Use illustrations the audience knows, e.g., time, neighborhoods. Most people tend to remember better when ideas are transmitted by picture or example.

+ Illustrations are particularly suitable to the criminal justice field where the data lend themselves to charts, graphs, and diagrams.

+ Anticipate Questions and Issues

SHOW V.A. (7-9):



EMPHASIZE (7-9):

+ Make explicit the assumptions of your presentation.

+ Brainstorm the problem/presentation with others to develop an awareness of what the weak points are and where to anticipate questions.

+ If a question is beyond available information, don't deceive your audience. To do so and be caught can ruin an analyst's credibility.

NOTES

+ Rehearsal and editing should be from the audience and reader's perspectives.

+ Plan responses to anticipate questions.

F. Use Terms Important to the Audience.

1. While the technical language is helpful if the group can use it, it is <u>not</u> if there are no technically trained people.

2. Conversely, if the audience has technical knowledge, then technical terms should be used appropriately.

3. Audiences and decision-makers resent efforts at being manipulated or patronized.

IV. PREPARING A WRITTEN REPORT

<u>Note</u>: This information should be oriented toward assisting participants in preparing the required portfolio for the Major Exercise.

A. Format

1. Avoid Major Omissions

2. Logical Organization is Vital

3. Consistency of Form, as well as Content, is Essential

   a. Constant Revision and Editing

   b. Familiarity with the Report

4. Writing must be Clear and to the Point

5. Report should Highlight the Priority Message(s)

B. Guides for use of quantitative data and statistics in written reports:

1. Purpose of data in a report must be clearly understood by the writer and the reader.

NOTES

   a. Data are useful in focusing attention.

   b. Can be used to build confidence in the conclusions.

2. Data should be integrated into the narrative.

   a. Use Proper Labels

   b. Proper interpretation of the data requires a narrative for every table, chart, or graph used. Don't leave the interpretation of a table, chart, or graph up to the reader.

   c. Data should support the text, not challenge it.

3. Selection of data should be made on the basis of its relevancy, clarity, validity, reliability, and assistance to the reader in understanding the problem.

C. Report Organization

SHOW V.A. (7-10):

REPORT ORGANIZATION

1.0 Crime and/or Criminal Justice System Problem(s)
- — concerns
- — issues
- — concepts/definitions

2.0 Analysis Methods
- — hypotheses
- — measurement of variables
- — data collection instruments and procedures
- — statistical methods used to interpret data

3.0 Findings
- — results
- — interpretation
- — conclusions
- — recommendations

4.0 Appendices

EMPHASIZE (7-10):

+ Data reporting should not:

  (1) Mask Message
  (2) Scare Reader

+ Tables and charts, unless used rigorously and sparingly, can be negative symbols.

+ The report should be consistent with the logic of the charts.

+ Exhibit 1, Module 1 provides a concrete example of this organization and should be referred to.

V. CONDUCTING A BRIEFING

A. Briefing Materials

1. Use of flipcharts, overheads, slides or other visual aids can be effective if clear, neat and informative.

2. Be sure that the visual aid is relevant to your priority message(s).

3. Be sure that the visual aid does not lead to questions for which you have no answers, e.g., know your data source's assumption behind the visual aid.

4. Avoid excessive visual aids. This can detract from and confuse your message.

5. Prepare a summary to distribute which succinctly covers the content of your briefing.

B. Manner of Presentation

1. Clearly specify individual responsibilities in a briefing, e.g., one person will cover statistical issues, another will treat the issue of audience perspective.

2. Speak to your audience, be direct, and know your own material.

3. Face your audience and locate your visual aids in a manner so that they are easily read.

4. Avoid "loaded" words and negative symbols.

5. Be responsive to audience reactions and questions.

SHOW V.A. (7-11):

BRIEFING GUIDELINES

Summary + Visual Aids + (• Roles • Directness • Clarity • Consistency • Ownership • Physical Elements) = Influence on Decision-Makers

EMPHASIZE (7-11):

+ Ownership means that when presenting a report, the analyst should be responsible for the content of it.

+ Physical element refers to the location of the analyst in relation to the audience--can they see and hear you?

WALK-THROUGH 'M'
CONDUCTING A PRESENTATION

PURPOSE:

This Walk-Through simulates the presentation task of the Major Exercise and the conduct of any formal briefing. The focus of the presentation is an oral briefing, based on the written problem statement concerning auto thefts in Chaos City, to the Criminal Justice Supervisory Board of Chaos City.

INSTRUCTOR NOTES

A. Using the scoring sheet of the Major Exercise, Task #6, evaluate with the participants the auto theft problem statement.

B. Either prepare a brief 10 minute oral presentation (with supporting V.A.'s) or, if available, show the video cassette recording of this briefing.

C. Have participants evaluate this briefing, again using the scoring sheet.

D. Summarize this review of both the problem statement and briefing with participants.

E. Schedule:

Preparation	5 minutes
Review Problem Statement	15 minutes
Review Oral Briefing	15 minutes
Debriefing	5 minutes

III. WALK-THROUGH 'M' WORKSHEET

CRITIQUE FORM

INSTRUCTIONS: Choose one of the ratings, i.e., FAIR, GOOD OR EXCELLENT, circle it, and record score in column. Complete Part I, then complete Part II; add the sub-total scores for Part I and Part II, and enter final score in weight scale column.

PART I: FINAL WRITTEN REPORT	FAIR 1-3	GOOD 4-7	EXCELLENT 8-10	SCORE
1. Is the problem clearly and accurately stated?				
2. Are the hypotheses complete?				
3. Is the list of variables and measures comprehensive and realistic?				
4. Are the techniques used to analyze the data appropriate?				
5. Is the interpretation of the data accurate and useful?				
6. Does the narrative properly emphasize the information?				
7. Is the problem statement easy to understand?				
MAXIMUM: 70 PTS.				
PART II: PRESENTATION	FAIR 1-3	GOOD 4-7	EXCELLENT 8-10	
8. How effectively are visual aids used?				
9. Is the presentation well organized and focused?				
10. How responsive and prepared is the group to questions?				
MAXIMUM: 30 PTS.			Sub-Total	
MAXIMUM: 100 PTS.			Total	

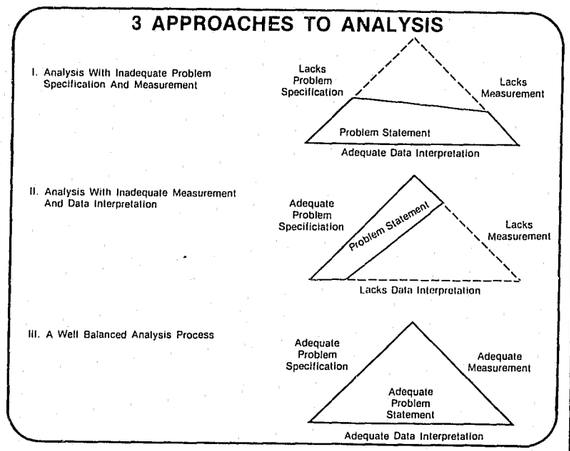
Comments: _____

VI. CONCLUSION

A. Finding Balance in Presentations: Two Meanings of Balance.

1. When well done, a problem statement, both written and orally presented, is a delicate balance between concepts, variables, hypotheses, measures, and data interpretation.

SHOW V.A. (7-12):



EMPHASIZE (7-12):

+ If too little emphasis is given to the conceptualization of the problem, the resulting hypotheses will suffer accordingly.

+ Typically, when too little thought is given to concepts, the result is massive "number crunching" without the production of much information. The analyst compares, graphs, contrasts, correlates, tabulates, and re-analyzes large volumes of data which result from an aimless searching when specific hypotheses are not constructed.

NOTES

+ Example: Suppose a patrol commander were to ask for an analysis of the department's performance without reducing his vague concerns to specific concepts. The result would be dismay, ambiguity, excessive analytic false starts, and the production of a confusing accumulation of answers without questions.

+ Another type of imbalance involves insufficient measurement. In this situation, concerns have been refined to specific concepts; but the process for securing data to analyze these concepts is haphazard, unscientific, superficial, or mismanaged. Not infrequently, the analyst is presented with specific questions; but, due to the pressures of time, inadequate preparation, or insufficient technical capability, the measurement of the concepts is insufficient or inadequate. The statistical procedures employed are superficial. Sampling procedures are inadequate. The amount of data gathered is too small or unrepresentative. Computational errors are made, and inappropriate statistical procedures are applied.

+ Example: The crime analyst responds to the patrol commander's concerns about performance by examining only the calls for police service on Friday and Saturday nights, disregarding the other days of the week. Or imagine if the analyst doesn't take into consideration seasonal fluctuations and the effects of climactic conditions on response time. Supposing the analyst only uses graphic or statistical techniques with which he is familiar even though the data do not meet minimum assumptions.

+ This type of imbalance results in problem statements which are superficial and unsubstantiated. The results of such analyses are difficult to replicate and do not lead to confident generalizations. Since this imbalance frequently results in superficial analyses, the resulting problem statements include suggested alternatives which attack symptoms not problems. They address the transitory aspects of the problem and may not result in any long-term solutions.

NOTES

2. A second meaning of balance is the development of both perspective and technical completeness.

SHOW V.A. (7-13):

SIMPLE MATH

~~C ED~~

CP=ED

(COMPLETENESS) + (PERSPECTIVE) = (EFFECTIVE DECISIONS)

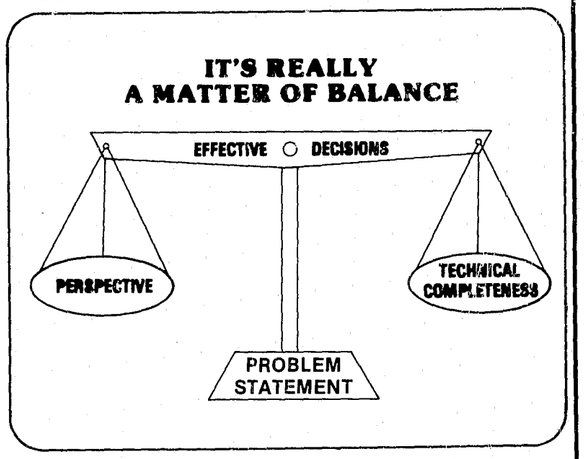
EMPHASIZE (7-13):

+ Problem specification, measurement and data interpretation, by themselves, are insufficient.

+ They must be refined and adjusted to the interests, concerns and perspectives of the audience.

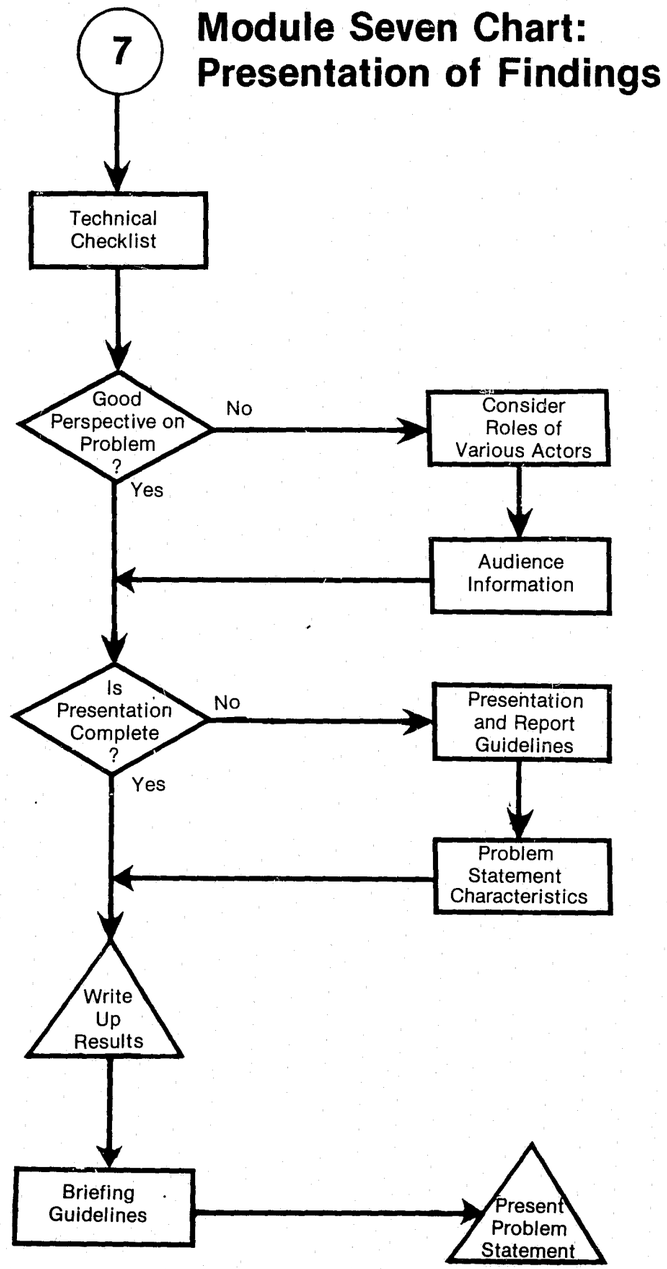
NOTES

SHOW V.A. (7-14):



Review the module chart. Conduct the briefing for Tasks #4, and #5 of the Major Exercise which concludes the course.

SHOW V.A. (7-15):



Major Exercise

MAJOR EXERCISE INTRODUCTION

I. OBJECTIVES

A. The purpose of the Major Exercise is to practice, develop and apply the skills, techniques and knowledge acquired during the Criminal Justice Analysis Course. While the focus is on the development of a problem statement, the general approach utilized and procedures incorporated in the exercise have direct bearing on all aspects of the criminal justice decision-making process: planning, program development, management or evaluation. Moreover, the process of developing a problem statement should generate many of the complex questions and difficult choices which would normally be encountered in crime or systems analyses.

B. The Major Exercise provides the analyst an opportunity to develop and present an original problem statement involving one of three current issues in criminal justice: (1) community crime prevention, (2) attrition in case dispositions, or (3) recidivism among adult offenders. These problem statements will be constructed step-by-step following the logic of the course and utilizing the methods and procedures of each module.

C. The Major Exercise makes a significant contribution to the achievement of the course goals. It provides a context for the exploration of the purpose and logic of analysis as used to formulate crime and criminal justice system problems. It requires careful selection and application of quantitative methods to crime and system data and the development of an effective presentation of a Problem Statement. Finally, the Major Exercise provides a setting for the analysis of many preconceived ideas about the complexity, ambiguity and/or lack of utility of analysis in criminal justice decision-making.

MAJOR EXERCISE: CHAOS CITY

II. ACTIVITIES AND PRODUCTS

A. The Major Exercise is divided into six specific tasks. Each task requires the application of modular material immediately preceding it.

B. The Six Tasks are as follows:

1. Task #1 - Specifying Problem
2. Task #2 - Assessing Hypotheses
3. Task #3 - Data Interpretation
4. Task #4 - Preparing Portfolio
5. Task #5 - Preparing Briefing
6. Task #6 - Presentations

MAJOR EXERCISE: CHAOS CITY

C. The Major Exercise is a small-group activity. All the Tasks except for Task #6 and the Tuesday P.M. debriefing will be conducted by each group in a separate break-out room. Each group will be aided by a facilitator who will provide technical assistance and material/supplies support as needed. Groups are to be structured according to their areas of experience/interest/needs, i.e., crime prevention, system analysis (attrition), recidivism, as well as to balance skill levels among groups. Groups will be maintained throughout the week.

1. To initiate the Major Exercise three Staff Reports (SR) have been prepared for review. These represent an initial effort at responding to the concerns of Chaos City's political leadership and citizenry. They are based on only current, readily available data.

2. The nature of the exercise requires each group to assume a specific role and audience within the hypothetical Chaos City environment. For instance, you may be asked to assume the role of court planner responding to the request of Chaos City's Chief Justice for an analysis of the case attrition problem. These roles and audiences are specified in the Staff Report (SR) and the facilitators can provide additional information.

3. Throughout the Major Exercise, participants should draw upon the modular material for ideas and instructions for proceeding. The worksheets and tasks of the Major Exercise very closely parallel the walk-throughs and exercises of the course.

4. Do not waste time on inferences and assumptions where no basis of data or information exist in the materials you are provided.

5. Each Task has its own set of instructions which follow the general form of the exercises in the course: I. Purpose, II. Activities, III. Data Set and IV. Worksheet.

6. The exercise is an analysis, not a plan to conduct an analysis. It requires your consideration throughout the week of the course, as indicated in Exhibit 1. (Major Exercise Tasks and Schedule).

D. Two specific products will be required of each group:

1. Portfolio

a. The first product is a written document consisting of two parts. The first part includes the completed worksheets for Tasks #1, and #2. These completed worksheets will be turned in Tuesday morning and reviewed during the debriefing Tuesday P.M. The second part of the portfolio consists of an edited, narrative problem statement of no longer than three pages (excluding charts and graphs). This problem statement, together with the finalized worksheets for Tasks #1, and #2, is to be turned in for review on Thursday evening at the conclusion of Task #4.

CONTINUED

4 OF 5

Major Exercise
Exhibit 1. Tasks and Schedule

TASK	ACTIVITY	TIME	DURATION	PRODUCT	PAGE	PAGE (P.G.)
#1	Specify Problem	Monday p.m.	120 min.	Worksheets		
#2	Assess Hypotheses		90 min.	Worksheets		
Debriefing	Review Tasks #1, #2 and #3	Tuesday p.m.	60 min.	---------		
#3	Data Interpretation	Thursday p.m.	120 min.	Worksheets		
#4	Preparing Portfolio	Thursday p.m.	120 min.	Portfolio		
Submit	Portfolio	By Thursday Evening				
#5	Preparing Briefing	Friday a.m.	60 min.	Briefing Materials		
#6	Presentations	Friday a.m./p.m.	180 min.	Formal Presentations		

b. The portfolio will be used for debriefing each group on its progress and will provide participants with a written record of an analysis application that may be referred to in the future.

2. Formal Presentation

The second product involves the organization and delivery of a formal presentation to a review panel. This presentation will last 15 minutes and cover the Problem Statement prepared by the group. It is to be presented to a panel consisting of course faculty and outside authorities and/or practitioners familiar with the issues being developed. Included in this panel may be the Mayor of Chaos City, the Criminal Court Judge, Chief of Police, District Attorney and supporting staff advisors.

E. Group Organization

1. Groups will be organized to achieve a balanced mixture of educational and experience levels within each group.

2. Each group will be assisted by a facilitator who will provide occasional guidance and some assistance.

3. The nature of the exercise and, specifically the product requirements, necessitates that each group organize itself. Initially a group leader and a recorder are required. Other roles will be specified during the conduct of the exercise.

TASK #1 - SPECIFY PROBLEM

I. PURPOSE

Task #1 initiates the Major Exercise and is designed to provide participants an opportunity for applying the technique of problem specification to a fairly vague preliminary analysis contained in a Staff Report. By using problem specification on these reports, as in actual experience, the analyst will be able to more clearly define the issues and concerns under study and to outline an approach for addressing these concerns.

II. INSTRUCTIONS

A. Each group will be assigned a Staff Report and Data-Set to review.

B. These statements and Data-Sets should be read and discussed by the group.

C. Each group is to prepare a problem specification related to their Staff Report and Data-Set.

D. The problem specification will be filled in on the Task Worksheets (Part A and Part B).

E. The problem specification should include concepts which are contained in the Staff Report. Also it should contain other concepts which the group believes are important to the problem. Such additions may include concepts which are ignored by the Staff Report and for which data is available.

F. The problem specification is to be prepared by:

1. Identifying and defining the major concepts related to the Staff Report.

2. Preparing a list of variables for each concept.

3. Preparing a list of measures for each variable from Data-Set.

4. Specifying at least three hypotheses relating concepts.

5. Specifying for each concept hypothesis at least two variable hypotheses; and for each variable hypotheses at least two measure-level hypotheses.

G. Throughout this task changes in concepts, variables measures and/or hypotheses should be considered as the group develops a clearer sense of the problem.

H. After a final reconsideration, the Task #1 Worksheets should be neatly prepared.

I. Time available for this task is 120 minutes.

III. INSTRUCTOR NOTES

A. The instructor is to brief the participants on Task #1 before they begin. This briefing should include:

1. Purpose of Task #1

2. Activities of Task #1

3. Describe, in general, the nature and content of the three Staff Reports -- a crime prevention problem, a case attrition problem, and a recidivism problem -- and their associated Data-Set.

4. Assign groups their respective Staff Report.

5. Point out that preliminary specifications of each Staff Report are provided in exhibits contained in Module 1. These should be referred to.

6. Indicate that while primary attention should be given to the portion of the data set most directly related to their problem, each group may make use of any part of the data set in their work.

B. After Task #1 has been briefed, ask if there are any questions. After responding to these, brief participants on Task #2.

C. Schedule - Task #1

Review Problem Statement	-	10 minutes
Review Data Set	-	10 minutes
Prepare Part A Worksheet	-	40 minutes
Prepare Part B Worksheet	-	40 minutes
Review Problem Specification	-	20 minutes
TOTAL		120 minutes

D. Make clear to the groups the need to designate a recorder during this Task.

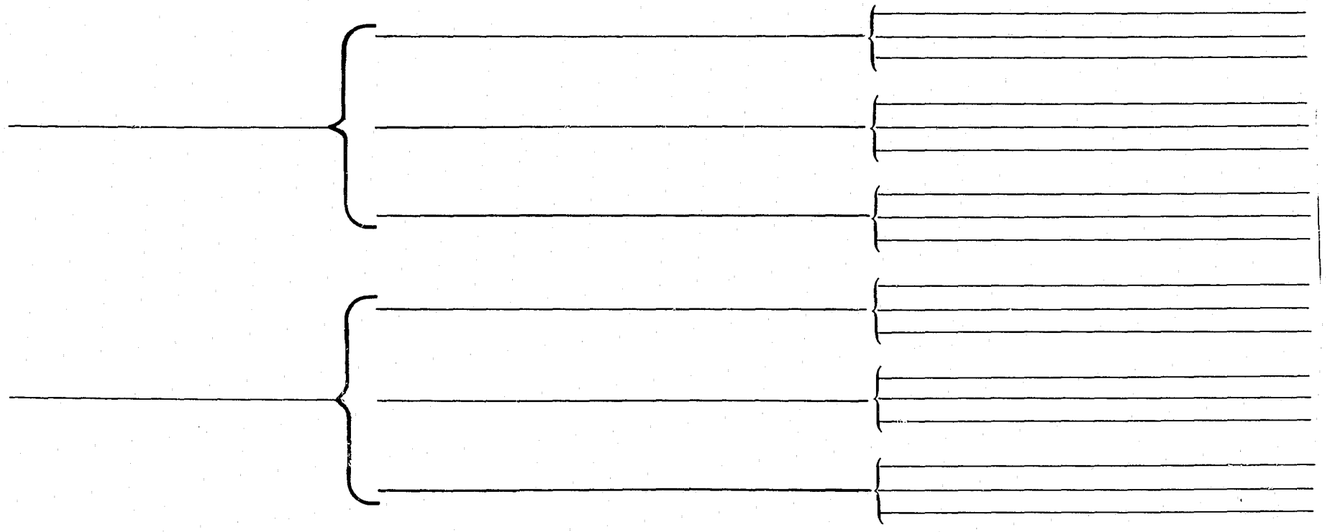
E. Provide extra copies of work sheets.

MAJOR EXERCISE: CHAOS CITY

MAJOR EXERCISE: CHAOS CITY
TASK I: PROBLEM SPECIFICATION
PART A: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN:

CONCEPTS	VARIABLES	MEASURES



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MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

TASK I: PROBLEM SPECIFICATION

PART B: CONSTRUCTING HYPOTHESES

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
1)	a)	1)
		2)
	b)	1)
		2)
2)	a)	1)
		2)
	b)	1)
		2)

MAJOR EXERCISE

TASK #2 - ASSESSING HYPOTHESES

I. PURPOSE

Task #2 requires a review and assessment of the completed problem specification in terms of 1) its comprehensiveness; 2) measurement error; and 3) its potential value to decision-makers. The product of this task is a rank-ordering of the hypotheses which will be interpreted in Task #3.

II. INSTRUCTIONS

A. List the hypotheses on the Task #2 (Part A) worksheet. Evaluate the hypotheses to determine which of the characteristics are covered. Place a check in the appropriate box(s) to indicate those characteristics covered. Count the number of checks in the row and enter that count in the last box of the row. After all rows have been summarized, count the number of checks in each column and enter your count in the box under the appropriate column.

B. Transfer the hypotheses and total characteristics information to the Part B worksheet.

C. Consider both conceptual and technical sources of measurement error in the available data. Comment in the appropriate box for each hypotheses whether these are significant factors impeding an understanding of the data.

D. Consider the probable utility of each hypothesis to the decision-maker.

- Are the measures in each hypothesis subject to influence by the decision-maker?

- Does the hypothesis address weaknesses in the original staff report?

- Will interpretation of the hypothesis contribute to a better understanding of the problem?

Record your observations of the respective value of each hypothesis on the Part B worksheet using a scale of 0-no value to 10--highly valuable.

E. Rank the hypotheses based on your assessment of its comprehensiveness, measurement error and value. Designate the hypothesis with greatest significance with a rank of 1. Sequentially rank the remaining hypotheses.

F. Briefly, state the rationale for your ranking and/or comment on your assessment of each hypothesis.

G. This completes Task #2. Total time available is 90 minutes. When completed, the worksheets for Tasks #1 and #2 are to be turned in to the staff. These will be reviewed and discussed during the debriefing Tuesday afternoon.

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

III. FACILITATOR NOTES

A. Go over the Task #2 worksheets with the participants.

B. Indicate that they should feel free to make changes in their Task #1 worksheets in light of the assessment and additional insights on the problem achieved during Task #2.

C. Neat and complete worksheets are due no later than the end of the day on Monday.

D. Task #1 and #2 are, perhaps, the most difficult and challenging tasks of the Major Exercise. It is critical that each group has by the end of the day at least three or four hypotheses which are supported by the Data Set and of value to the problem. Facilitators should cue groups during Task #1 to such hypotheses if not generated by the group discussion in the time provided.

E. Extra worksheets may be needed by the groups.

F. Schedule - Task #2

Assess Comprehensiveness	-	20 min.
Assess Measurement Error	-	15 min.
Assess Value	-	20 min.
Review Specification	-	15 min.
Rank and Comment	-	20 min.
TOTAL		90 min.

DRAFT

MAJOR EXERCISE: CHAOS CITY
TASK 2: ASSESSING HYPOTHESES
PART A: DETERMINING COMPREHENSIVENESS

FROM TASK I SELECT UP TO TEN MEASUREMENT LEVEL HYPOTHESES TO BE ASSESSED:	TYPE OF CHARACTERISTICS								
	MAGNI-TUDE	CHANGE	SERIOUS-NESS	TARGET	SPATIAL	TEMP-ORAL	SYSTEM RESPONSE	OTHER	TOTAL NO. CHARACTER-ISTICS BY HYPOTHESES
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
TOTAL BY TYPE OF CHARACTERISTICS									

M E-12-IG

MAJOR EXERCISE: CHAOS CITY

DRAFT

MAJOR EXERCISE: CHAOS CITY
TASK 2: ASSESSING HYPOTHESES
PART B: EVALUATING & PRIORITIZING HYPOTHESES

CARRY FORWARD FROM PART A		MEASUREMENT ERROR		DETERMINE VALUE	RANK	RATIONALE/COMMENTS
HYP. NO.	TOTAL CHARACTERISTICS	CONCEPTUAL	TECHNICAL			

MAJOR EXERCISE: CHAOS CITY
TASK 2: ASSESSING HYPOTHESES
PART A: DETERMINING COMPREHENSIVENESS

FROM TASK I SELECT UP TO TEN MEASUREMENT LEVEL HYPOTHESES TO BE ASSESSED:	TYPE OF CHARACTERISTICS								
	MAGNI-TUDE	CHANGE	SERIOUS-NESS	TARGET	SPATIAL	TEMP-ORAL	SYSTEM RESPONSE	OTHER	TOTAL NO. CHARACTER-ISTICS BY HYPOTHESES
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
TOTAL BY TYPE OF CHARACTERISTICS									

MAJOR EXERCISE: CHAOS CITY
TASK 2: ASSESSING HYPOTHESES
PART B: EVALUATING & PRIORITIZING HYPOTHESES

CARRY FORWARD FROM PART A		MEASUREMENT ERROR		DETERMINE VALUE	RANK	RATIONALE/COMMENTS
HYP NO.	TOTAL CHARACTERISTICS	CONCEPTUAL	TECHNICAL			

Major Exercise
Debriefing
Tasks #1 and #2

I. PURPOSE

The debriefing provides an opportunity for discussion of the results of the first two tasks. It is focused on the substantive, procedural and technical aspects of these tasks.

II. INSTRUCTOR NOTES

A. Copies of the Task #1 and #2 Worksheets should be picked up from the groups Monday evening and reviewed by the instructor and facilitators prior to the debriefing.

B. Carefully review the group worksheets prior to debriefing and, at the conclusion of the debriefing provide each group with a set of your written comments. In these comments suggest gaps in logic, or substantive understanding that, with correction, will strengthen their final product.

C. Sufficient copies of the Task #1 and #2 worksheets should be made and distributed at the beginning of the debriefing to participants.

D. The debriefing is to be conducted by the instructor with the assistance of the facilitators.

1. Prepare on newsprint each group's final list of hypotheses. Post these in a location that all can see.

2. In commenting on the participants' work, focus on their strengths and weaknesses and solicit from the group comments on problems encountered in hypothesizing.

3. Be sure that the following are understood by the end of the debriefing:

a. What a Good Problem Statement is
b. What a Concept is
c. What a Hypothesis is
d. What Variables and Measures are
e. How Specification is Used to Elaborate a Concern into Understandable and Testable Propositions

4. The debriefing should next be opened to questions and comments from the participants.

5. The written comments prepared by the instructor and facilitators should be distributed to the groups at the conclusion of the debriefing. The instructor and facilitators should make themselves available to clarify comments not addressed during the debriefing.

E. Sixty minutes are available for this debriefing.

TASK #3 - DATA INTERPRETATION

I. PURPOSE

Task #3 requires the selection, application and interpretation of various methods to produce information that is to be part of the Problem Statement prepared by each group.

II. INSTRUCTIONS

A. Task #3 involves selection, calculation and interpretation of the various methods covered in Modules 3-6 on the hypotheses identified in Task #2.

B. These interpretations are to be used in preparing the required narrative problem statement.

C. The full range of methods covered should be considered, including:

1. Descriptive--Central Tendency, Variation, and Graphics

2. Comparative--Rates and Index Numbers, Cross Tabulations and Scatter Plots

3. Inferential--Testing Hypotheses

4. System Methods--Applying Concepts and Input/Output Flow Analysis

D. The module charts will be useful in assuring the selection of the appropriate methods and obtaining maximum use of the available data.

E. Groups should approach the task with a specific strategy and division of labor in mind. For example, each person might be assigned one hypothesis to examine and proceed from first describing the measures to comparing them and finally, if possible, testing their relationship.

F. For each statistic developed, and graph or chart prepared, an accompanying narrative statement is to be written.

G. In recording your work during Task #3 prepare a worksheet for each hypothesis interpreted.

III. INSTRUCTOR NOTES--TASK #3

A. Some groups may need to return briefly to Tasks #1 and #2 to obtain closure and group understanding of the debriefing comments. Time spent on this must be limited by the facilitators. At a minimum before beginning Task #3, each group needs agreement on their measurement-level hypotheses.

B. The open-endedness of the Task will produce some frustration and "wheel-spinning" on the part of certain groups. It is important that these groups be provided more structure in conducting this task. Facilitators will need to carefully monitor their groups in the event a more active part is required in the group's initial work on Task #3. However, the purpose of the Task is to have participants come to terms

with the complex choices and risks associated with performing data interpretation. This requires essentially independent action on each group's part.

C. The time allotments within this task, while flexible, should be approximately:

1.	Briefing	10 min.
2.	Designing a Data Interpretation Strategy	15 min.
3.	Performing Data Interpretation	60 min.
4.	Organizing and Recording Findings	35 min.
	TOTAL	120 min.

D. The instructor and facilitators should be flexible on the time spent on each activity during Task #3. Adequate time should be given to Task #4 which is to be completed immediately following Task #3. There is no reconvening of the groups prior to Task #4.

TASK #3 - WORKSHEET
DATA INTERPRETATION

Hypothesis:

I. DESCRIPTIVE INTERPRETATION

II. COMPARATIVE INTERPRETATION

III. INFERENTIAL INTERPRETATION

TASK #4 - PREPARING PORTFOLIO

I. PURPOSE

This task is designed to use and build on the skills and information developed throughout the week and most particularly those discussed in the preceding module on the presentation of analytical findings. During the previous tasks of the Major Exercise, a data base has been reviewed, a concern has been identified and conceptualized, hypotheses have been developed and the data has been carefully studied and interpreted. The next step of the process--Preparing a Written Presentation -- will be completed in this part of the exercise will be completed in this part of the exercise.

This task provides the participant an opportunity to develop and deliver a written presentation that utilizes the presentation guidelines suggested in Module 7. This presentation should be well organized, make use of graphics and other presentation techniques and, most significantly, should demonstrate both an understanding of the audience who will review the products of the analysis and be sound technically with the results sensitive to the needs of the user.

II. INSTRUCTIONS

A. Review your previously prepared worksheets and identify the priority messages and supporting information which will be used to finalize your portfolio.

B. Finalize your portfolio consisting of:

1. Completed/Legible Worksheets for Tasks #1 - #3.

2. A Two to Three Page Narrative Problem Statement (Tables, Charts or Graphs not Included in Page Count).

C. Edit the portfolio and finalize its content.

D. The portfolio is to be completed and submitted by Thursday evening.

III. INSTRUCTOR NOTES

A. In preparing the groups for Task #4, the facilitator should:

1. Go over in detail the two final products expected. Indicate the cover sheet should be completed by the group.

2. Identify the membership of the review group (a Mayor, Chief Judge, District Attorney, Police Chief and Supporting Staff).

3. Indicate that the contents of Module 7 are to be drawn upon in developing these products.

4. Refer to the Critique Form and indicate the five criteria to be used in evaluating the Portfolio.

5. Remind the group that the portfolio will have to be submitted at the completion of this Task and no later than Thursday evening.

B. During Task #4 the groups should be monitored for progress in preparing the Portfolio. Following is a recommended time budget for this task.

1.	Clean-up Tasks #1 - #3 Worksheets	20 min.
2.	Identify Priority Messages and Supporting Information	20 min.
3.	Prepare Problem Statement Narrative	60 min.
4.	Review Portfolio	20 min.
	TOTAL	120 minutes

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

TASK #4 -- COVERSHEET

TITLE: _____

_____

_____

_____

FINAL REPORT

GROUP: _____

CONTENTS

Task #1 Worksheets

Task #2 Worksheets

Task #3 Worksheets

Problem Statement Narrative

PREPARED BY:

_____

_____

_____

_____

_____

_____

MAJOR EXERCISE: CHAOS CITY

TASK #4 WORKSHEET

CRITIQUE FORM

INSTRUCTIONS: Choose one of the ratings, i.e., FAIR, GOOD OR EXCELLENT, record score in column.

CRITERIA	FAIR 1-4	GOOD 5-9	EXCELLENT 10-14	SCORE
1. Is the problem clearly and accurately stated?				
2. Are the hypotheses complete?				
3. Is the list of variables and measures comprehensive and realistic?				
4. Are the techniques used to to analyze the data appropriate?				
5. Is the interpretation of the data accurate and useful?				
6. Does the narrative properly emphasize the information?				
7. Is the problem statement easy to understand?				
MAXIMUM 70 PTS.			Sub-Total	

TASK #5 and #6 - PREPARING AND DELIVERING BRIEFING

I. PURPOSE

The final tasks of the exercise require the preparation and delivery of a formal presentation. At the conclusion of each group's presentation of its problem analysis, a debriefing of both the oral presentations and written portfolios will be held.

II. INSTRUCTIONS

A. Prepare an Oral Presentation Consisting of:

1. A 15-Minute Briefing to a Review Group of the Problem Statement

2. Use Appropriate Visual Aids, e.g., Flip Charts, Overheads

3. Respond to Review Group Questions for 5-10 Minutes

B. In preparing the oral presentation, assignments are to be made to individual presenters. If time permits, a dry-run should be held to rehearse the presentation.

C. The groups should "brain storm" the weaknesses in their portfolio and presentation in anticipation of the review group's questions.

III. INSTRUCTOR NOTES

A. Go over the activities and schedule for Tasks #5 and #6.

1. Task #5

* Prepare Briefing Material	30 min.
* Rehearse Briefing	15 min.
* Finalize Briefing	15 min.

2. Task #6

* Group Presentations	60 min.
* Review Group Questions	30 min.
* Debriefing and Discussion	90 min.

B. Refer to the critique form and indicate the three criteria to be used in evaluating the oral presentations.

C. A recommended procedure for conducting Task #6 is to have the first group -- randomly assigned -- make its presentation and then have selected questions from the review group. Indicate to the groups that questions about either their oral presentation or portfolio can be anticipated. The review group, in assessing the portfolios Thursday evening should prepare one or two questions for each group in advance of the oral presentations.

D. Distribute the critique forms for each group. In conducting the debriefing be sure to allow audience questions, comments and reactions. Invite their participation in the debriefing by having them react to the presentations.

E. The debriefing should focus on the process and substantive problems encountered by the groups and their solutions to these. As these points surface in the general discussion following the presentations, they should be recorded on newsprint.

F. The review group should be sure to also identify strengths in each groups work.

G. A second important function of the Debriefing is to identify the specific knowledge, skills or attitudes that can be transferred from the training environment to their work. This debriefing also provides an excellent opportunity to summarize the major course themes identified in the Introduction.

MAJOR EXERCISE: CHAOS CITY

TASK #5 - CRITIQUE FORM

CRITERIA	FAIR 1-3	GOOD 4-7	EXCELLENT 8-10	SCORE
1. Is the presentation well organized and focused?				
2. How effectively are visual aids used?				
3. How responsive and prepared is the group to questions?				
MAXIMUM: 30 PTS.			TOTAL	

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY
TASK #6 CRITIQUE FORM

INSTRUCTIONS: Choose one of the ratings, i.e., FAIR, GOOD OR EXCELLENT, circle it, and record score in column. Complete Part I, then complete Part II; add the sub-total scores for Part I and Part II, and enter final score in weight scale column.

CRITERIA PART I: FINAL WRITTEN REPORT	FAIR 1-3	GOOD 4-7	EXCELLENT 8-10	SCORE
1. Is the problem clearly and accurately stated?				
2. Are the hypotheses complete?				
3. Is the list of variables and measures comprehensive and realistic?				
4. Are the techniques used to to analyze the data appropriate?				
5. Is the interpretation of the data accurate and useful?				
6. Does the narrative properly emphasize the information?				
7. Is the problem statement easy to understand?				
MAXIMUM: 70 PTS.			Sub-Total	
CRITERIA PART II: PRESENTATION	FAIR 1-3	GOOD 4-7	EXCELLENT 8-10	
8. How effectively are visual aids used?				
9. Is the presentation well organized and focused?				
10. How responsive and prepared is the group to questions?				
MAXIMUM: 30 PTS.			Sub-Total	
MAXIMUM SCORE: 100			Total	

Comments: _____

MAJOR EXERCISE

MAJOR EXERCISE-STAFF REPORTS

STAFF REPORT
ON
CRIME PREVENTION IN CHAOS CITY

As recent newspaper headlines have indicated, Chaos City has a major crime problem. An apparent wave of robberies, burglaries and auto thefts has spread throughout the city resulting in a growing concern about neighborhood safety and pressure for increased preventive measures. At the request of the mayor, this Preliminary Analysis Statement has been prepared to summarize what is currently known about this problem.

During 1977 police records indicate that there were 8800 burglaries (79.5% residential), 1900 robberies (63.2% street robberies), 3600 assaults (including 150 rapes), and 4000 auto thefts. (See Table 1.)

Table 1. Chaos City Neighborhood Crime Data, 1977

TYPE OF CRIME	CENTRAL	WESTSIDE	NEIGHBORHOOD UNIVERSITY	PARK	WASHINGTON	TOTAL ARRESTS
Residential Burglary	800	2400	700	2100	1000	7000
Commercial Burglary	500	500	200	400	200	1800
Commercial Robbery	200	100	50	300	50	700
Street Robbery	500	200	100	300	100	1200
Assault (Rape)	600 (20)	900 (18)	400 (75)	900 (18)	800 (19)	3600 (150)
Auto Theft	2000	400	400	1000	200	4000
Totals	4600	4600	1850	5000	2350	18,300

Source: Chaos City Police Department, 1978.

While no neighborhood has been unaffected by the crime wave, certain neighborhoods appear to be less prone to certain crimes. For example, the Washington area had only 200 auto thefts reported in 1977. Other areas, in contrast, appear to be suffering a disproportionate share of the crimes. For example, there were 75 rapes in the University area; 2400 residential burglaries were on the Westside; 500 commercial robberies and the 500 street robberies in Central indicate, to some extent, a localized pattern to these different offenses.

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

A recent victimization survey of city residents conducted by the Survey Research Center at Paradise University indicates that (1) more than 47% of the city's residents feel unsafe in their neighborhood; (2) 46% are restricting their activities because of a fear of crime; and that (3) 32% of the residents perceive crime to be increasing. (See Table 2.)

A number of factors may be contributing to the crime problem in Chaos City. The data indicate that large numbers of illegal entries are unforced, thus, suggesting that residents and businessmen may be failing to employ basic security measures. Certain city areas as well as certain targets may be more prone to crimes than other areas due to physical and/or social/economic characteristics. Current police policies of distributing patrol resources evenly throughout the city and around the clock may not be consistent with the prevailing patterns in these certain crime categories. Indeed, the evidence suggests that crime is a major problem in Chaos City. New policies and programs need to be implemented by which the fear and the reality of crime in the city can be reduced.

You are an analysis team located in the mayor's office. You report to the mayor and the chief of police who was appointed by the mayor as his primary law enforcement authority. Your assignment is to clarify the crime problem for the mayor and chief of police so that crime reduction strategies can be implemented by the city.

Chaos City has never had an explicit planned crime prevention program. The city administration at this time seems to have become more receptive to crime prevention programs because of the public's perception of crime in the city and from the influence of national crime prevention programs on the federal level and in other cities.

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

Table 2. Chaos City 1977 Public Opinion Survey

SURVEY	CHAOS CITY RESIDENTS
1. Neighborhood Safety	%
Very Safe	16.5%*
Reasonably Safe	35.9%
Somewhat Unsafe	26.9%
Very Unsafe	20.7%
2. Safety Compared to Other Neighborhoods	
Much More Dangerous	2%*
Somewhat More Dangerous	8%
About the Same	39%
Less Dangerous	36%
Much Less Dangerous	14%
3. Limiting Activity Because of Crime	
Yes	46%*
No	54%
4. Neighborhood Crime Trend	
Increased	32%*
Decreased	7%
About the Same	50%
Don't Know	11%
5. Evaluation of Police Performance	
Good	37%*
Average	46%
Poor	17%

* May not add to 100% due to rounding n = 1500
Source: Paradise University, Survey Research Center, 1978.

MAJOR EXERCISE

STAFF REPORT
ON
ATTRITION RATE OF CASES IN CHAOS CITY

A recent article in the Chaos Rag has brought attention to the problem of crimes committed by individuals who, while arrested, have never been brought to trial. Specifically, the Rag's article concerned a man who was arrested three separate times for burglary, but each case never reached the court. Most recently the man was captured after he had shotgunned an elderly couple to death as he robbed their small grocery store. There was less than $150 in their cash register. At the request of the Mayor this staff report has been prepared to provide background on this problem.

A quick analysis of available data indicates that in 1977, the Chaos City case drop-out rate from the point of arrest to court filing was high for both felony and misdemeanor cases. Of a total of 24,798 adults arrested there were 5,724 felony and 6450 misdemeanor cases filed. In other words, there were about twice as many arrests as filings. A one-to-one ratio between filings and arrests is unrealistic, but a one-to-two ratio seems excessively high. (See Table 1.)

Table 1. Chaos City Arrests and Case Filings, 1977

41,490 Total Arrests			
12,300 Adult Misdemeanor Arrests	12,498 Adult Felony Arrests	5,802 Juvenile Felony Arrests	10,890 Juvenile Misdemeanor Arrests
6,450 Adult Misademeanor Filings	5,724 Adult Felony Filings	603 Juvenile Felony Filings	780 Juvenile Misdemeanor Filings

Source: Chaos City Police Department, 1977

MAJOR EXERCISE

Cases are frequently dropped because either the victim refuses to prosecute or the DA does not accept the case because of insufficient evidence. Some of the disparity between arrest and filing rates can be attributed to multiple cases involving the same suspect or several suspects involved in the same filing, and does not necessarily represent poor quality arrests. However, with evidence problems apparent in 53% of the cases which the DA refused to prosecute, the quality of case preparation by the investigator may represent a legitimate problem area. (See Table 2.)

MAJOR EXERCISE

Table 2. Reasons for DA Case Refusal, 1977

Reason for Refusal	N	%
Evidence Problem		
Inadmissable evidence	1357	30
Unavailable physical evidence	226	5
Insufficient physical evidence	814	18
Witness Problem		
Unable to locate	91	2
Related/friend of offender	181	4
Witness story/credibility	226	5
Reluctant to get involved w/system	181	4
Prosecutorial Merit		
Multi-case disposition	271	6
Office policy	91	2
Diversion program	995	22
Unknown	91	2
TOTAL	4524	100%

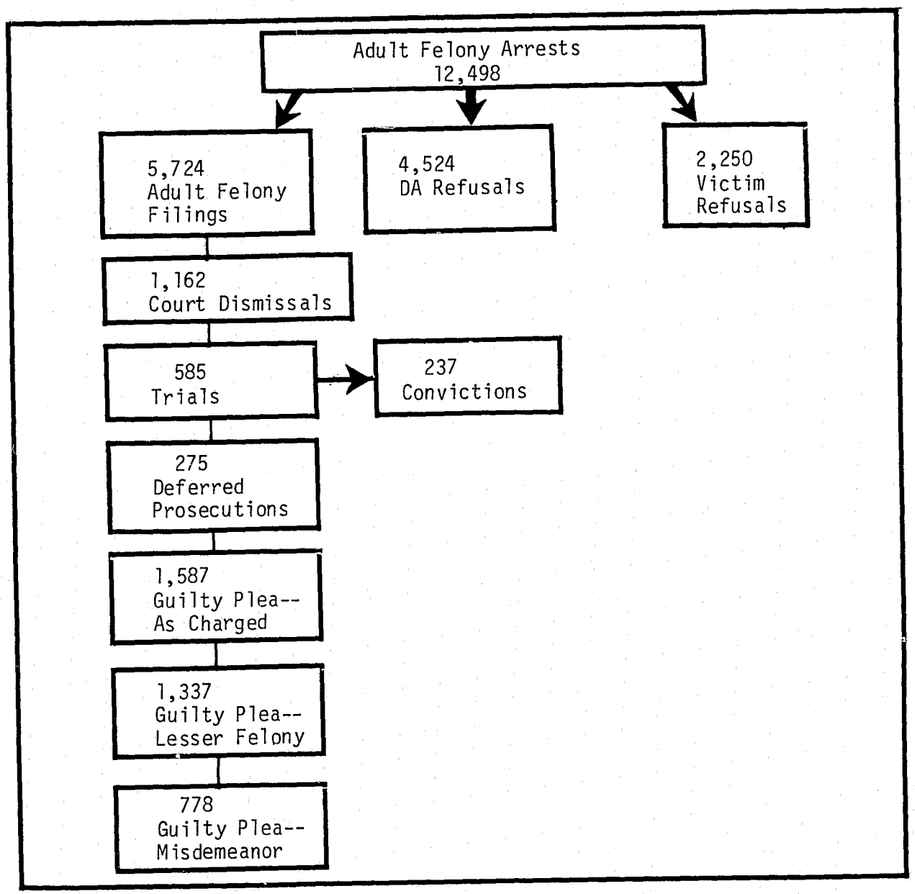
Source: Chaos City District Attorney's Office, 1978.

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

What is even more disturbing is the disposition of cases after filing. Although 7% are still pending, only 10% of the 5724 felony filings in 1977 were actually tried. Even among these, the defendant was frequently acquitted. A more significant finding, however, is that 20% of the cases were dismissed and 5% were deferred prosecution. The remaining cases were disposed of with a guilty plea, with over half of these involving pleas negotiated to a lesser offense. Convictions were obtained for only 41% of the felony filings (See Table 3).

MAJOR EXERCISE

Table 3. Chaos City Arrests, Felony Filings and Case Dispositions, 1977



Source: Chaos Police Department OBTS System - Includes homicides, rape, robbery, burglary, assaults, theft, 1978.

STAFF REPORT
ON
CRIMINAL RECIDIVISM AMONG ADULT OFFENDERS IN CHAOS CITY

The failure of our criminal justice systems' rehabilation components is suggested by a recent study released by Paradise University's Criminal Justice Research Center. Their study revealed that over a two year follow-up period, a sample of 250 felony offenders were rearrested at the rate of 48% and reconvicted at a rate of 30%. Among the 48% who were rearrested at least once, the mean number of rearrests was 2.7. Rearrest rates were found to be higher among certain types of offenders (such as burglars) than other crime categories (such as assault). (See Table 1.)

Table 1. Two Year Recidivism Rates
for Adult Offenders in Chaos City

Original Commitment Offense	Number of Cases	Rearrested	Not Rearrested	Reconvicted	No Reconvictions
Assault	40	10 (25%)	30 (75%)	6 (15%)	34 (85%)
Rape	25	4 (16%)	21 (84%)	4 (16%)	21 (84%)
Robbery	61	32 (52%)	29 (48%)	17 (28%)	44 (72%)
Burglary	75	44 (59%)	31 (41%)	25 (33%)	50 (67%)
Theft	49	30 (61%)	19 (39%)	22 (45%)	27 (55%)
Total	250	120 (48%)	130 (52%)	74 (30%)	176 (70%)

Source: Paradise University, Criminal Justice Research Center, 1978

There is concern in the Chaos City criminal justice community about the recidivism problem. The Chief of Police has publicly stated that relatively few offenders account for most serious felony arrests in Chaos City. He further contends that these "career criminals" are frequently not convicted or, if convicted, given sentences that are too light. There is general concern among the judges about the effectiveness of their sentencing practices. The issue of whether length of sentence affects recidivism has repeatedly been raised.

The Chief Probation Officer feels that offenders are less likely to recidivate if given employment and related support services when released. He also feels that the sentencing recommendations made by his staff on the pre-sentence report are based upon socio-economic and other background characteristics of the offender are good predictors of recidivism, and that judges should follow these recommendations more consistently.

The probation officer has found in a follow-up study of the Paradise University Recidivism Study that when the court closely followed his recommended sentence, only 40% of the offenders were rearrested compared to 60% when his report was not followed at all. (See Table 2.)

Table 2. Influence of Pre-Sentence Report on Rearrests, 1977

	Pre-Sentence Report:			
Offender Status	Not Followed	Influenced	Closely Followed	Total
Rearrested	60	40	20	120
Not Rearrested	40	60	30	130
Totals	100	100	50	250

Source: Chaos City, Chief Probation Officer, Department of Corrections, 1978.

MAJOR EXERCISE
DATA SET

MAJOR EXERCISE

Table A-1. Chaos City 1977 Census Data

HOUSING UNITS	#	%
Single Family	73,500	49
Two-Four Plex	26,800	18
Apartment	49,700	33
TOTAL	150,000	100

COMMERCIAL ESTABLISHMENTS	#
Gas Stations	165
Drug Stores	51
Schools	133
Grocery Stores	140
Hotel/Motels	131
Department Stores	82
Bars/Restaurants	301
Factory Buildings	253
Office Buildings	4050
Banks	98
Other	3596

POPULATION CHARACTERISTICS		
SEX	#	%
Male	171,500	49
Female	178,500	51

AGE	#	%
Under 5	28,600	8
5-14	62,900	18
15-19	31,900	9
20-34	73,800	21
35-64	114,000	32

RACE	#	%
White	245,000	70
Black	101,000	29
Other	4,000	1

HOUSEHOLD INCOME LEVEL	#	%
Below $5000	16,500	11
$5000--6999	18,100	12
7000--9999	26,800	18
10,000-14,000	43,800	29
15,000-24,999	28,200	19
25,000 +	16,600	11

Source: Chaos City Planning Department Estimates, 1978.

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

Table A-2. Chaos City, Neighborhood Data, 1977

CHARACTER-ISTICS	CITY TOTAL	NEIGHBORHOOD				
		CENTRAL	WESTSIDE	UNIVERSITY	PARK	WASHINGTON
Population	350,000	65,000	90,000	50,000	80,000	65,000
Geog. Size	70 sq.mi.	5	22	10	18	15
Housing Units	150,000	25,000	40,000	25,000	36,000	24,000
Commercial Establishments	9,000	3,000	2,000	1,000	2,500	500
Median Income Households	11,400	9,100	12,900	14,200	6,800	21,500
% Minority	30%	54%	1%	2%	86%	1%

Source: See Table A-1.

Table A-3. 1971-1977 Census Data for Chaos City

CATEGORY	1971	1972	1973	1974	1975	1976	1977
Population	250,000	270,000	300,000	310,000	330,000	340,000	350,000
Housing Units	90,000	100,000	115,000	120,000	135,000	140,000	150,000
Commercial Establishments	5,300	5,800	6,300	7,300	8,000	8,600	9,000

Source: See Table A-1.

MAJOR EXERCISE

Table A-4. Chaos City, Reported Crime Data, 1971-1977

CRIME CATEGORY	1971	1972	1973	1974	1975	1976	1977
Residential Burglary	4100	4000	4900	6000	5800	6800	7000
Commercial Burglary	540	600	650	700	1000	1500	1800
Commercial Robbery	250	300	360	500	550	600	700
Street Robbery	300	350	450	600	850	1000	1200
Assault (Incl. Rape)	2600 (101)	2800 (98)	3100 (97)	3200 (110)	3500 (92)	3400 (120)	3600 (150)
Auto Theft	3800	3700	4000	4100	3900	3800	4000
Total	11,590	11,750	13,460	15,100	15,600	17,100	18,300

Source: Chaos City Police Department, 1978.

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

Table A-5. Chaos City, Public Opinion Survey, 1977

SURVEY RESPONSE	NEIGHBORHOOD				
	CENTRAL	WESTSIDE	UNIVERSITY	PARK	WASHINGTON
Neighborhood Safety					
Very Safe	10%	15%	23%	4%	38%
Reasonably Safe	31%	46%	39%	29%	31%
Somewhat Unsafe	31%	18%	26%	36%	25%
Very Unsafe	28%	21%	12%	31%	6%
Safety Compared to Other Neighborhoods					
Much More Dangerous	2%	1%	1%	3%	1%
Somewhat More Dangerous	11%	8%	4%	12%	6%
About the same	43%	33%	39%	48%	32%
Less Dangerous	32%	40%	39%	31%	41%
Much Less Dangerous	12%	18%	17%	6%	20%
Limiting Activity Because of Crime					
Yes	56%	45%	41%	47%	39%
No	44%	55%	59%	53%	61%
Neighborhood Crime Trend					
Increased	42%	38%	47%	10%	30%
Decreased	3%	7%	4%	8%	10%
Same	39%	42%	37%	71%	58%
Don't Know	16%	13%	12%	11%	2%
Evaluation of Police Performance					
Good	26%	49%	39%	13%	65%
Average	49%	40%	52%	54%	32%
Poor	25%	11%	9%	33%	3%
	n=248	n=402	n=251	n=360	n=238

Source: Paradise University, Survey Research Center, 1978.

MAJOR EXERCISE

Table A-6. 1977 Residential Burglary Characteristics

MONTH OF OCCURENCE	#	%
January	138	6.9
February	145	7.3
March	133	6.7
April	141	7.1
May	179	9.0
June	204	10.2
July	218	10.9
August	231	11.6
September	169	8.5
October	174	8.7
November	138	6.9
December	130	6.5
TIME OF DAY		
Day (6AM-6PM)	542	27.1
Night (6PM-6AM)	709	35.5
Unknown	749	37.5
PLACE OF ENTRY		
Front	720	36.0
Side	860	43.0
Back	420	21.0
TYPE OF ENTRY		
Force	1460	73.0
No Force	540	27.0
TYPE OF TARGET		
Single-Family Dwelling	1080	54%
Two-Four Plex	380	19%
Apartment	540	27%

Table A-6. - Continued

PROPERTY LOSS VALUE	#	%
0	261	13%
1-99	82	4%
100-199	319	16%
200-299	378	18%
300-399	220	11%
400-499	203	10%
500-599	162	8%
600-699	101	5%
700-799	99	5%
800-899	83	4%
900-999	58	3%
1000 +	34	2%

TYPE OF ENTRY BY TYPE OF STRUCTURE

TYPE OF ENTRY	SINGLE	TWO-FOUR PLEX	APARTMENT	TOTAL
Unforced				
Window	5%	7%	5%	6%
Door w/o key	13% 20%	17% 28%	18% 36%	15% 36%
Door w/ key	2%	4%	13%	6%
Forced				
Window	34%	28%	23%	20%
Door	46% 80%	44% 72%	41% 64%	44% 64%
	n=1080	n=380	n=540	n=2000

Source: Chaos City Police Department, 1978
(Based on a sample of 2000 police reports)

Table A-7. 1977 Commercial Burglary Characteristics

MONTH OF OCCURRENCE	#	%
January	65	7.2
February	74	8.2
March	61	6.8
April	82	9.1
May	73	8.1
June	89	10.0
July	91	10.1
August	73	8.1
September	66	7.3
October	81	9.0
November	74	8.2
December	71	7.9
TIME OF DAY		
Day (6am-6pm)	76	8.5
Night (6pm-6am)	652	72.4
Unknown	172	19.1
PLACE OF ENTRY		
Front	361	40.1
Side	256	28.4
Back	247	27.4
Other/Unknown	36	4.0
TYPE OF ENTRY		
Force	760	84.5
No Force	140	15.5
TYPE OF TARGET		
Gas Station	61	6.8
Drug Store	10	1.1
School	34	3.8
Grocery Store	27	3.0
Hotel/Motel	31	3.4
Department Store	5	.6
Bar/Restaurant	33	3.7
Factory	36	4.0
Office Building	220	24.5
Other	443	49.2

Table A-7. - Continued

PLACE AND METHOD OF ENTRY BY TYPE OF TARGET

TYPE OF TARGET	PLACE OF ENTRY				TYPE OF ENTRY	
	Front	Side	Back	Other/Unk.	Force	No Force
Gas Station (n=61)	27	22	9	3	60	1
Drug Store (n=10)	4	2	3	1	10	-
School (n=34)	7	22	4	1	27	7
Grocery Store (n=27)	14	5	5	3	25	2
Hotel/Motel (n=31)	27	1	2	1	4	27
Department Store (n=5)	3	1	1	-	5	-
Bar/Restaurant (n=33)	13	2	18	-	30	3
Factory (n=36)	7	16	12	1	27	9
Office Building (n=220)	79	63	75	3	168	52

Source: See Table A-6. (Based on a sample of 900 police reports)

Table A-8. Street Robbery, 1977

TYPE	#	%
Personal	502	84
Purse-snatch	73	12
Business	25	4
MONTH OF OCCURRENCE		
January	41	7
February	49	8
March	40	7
April	60	10
May	47	8
June	58	10
July	42	7
August	57	9
September	62	10
October	40	7
November	55	9
December	49	8
TIME OF DAY		
Midnight-9am	95	16
9am-3pm	132	22
3pm-Midnight	373	62
LOCATION		
Street	443	74
Parking Area	55	9
Alley	49	8
Other	53	9
VICTIM SEX		
Male	263	44
Female	337	56
VICTIM AGE		
Juvenile (-18)	91	15
Young Adult (18-29)	127	21
Older Adult (30-64)	238	40
Elderly (65+)	144	24
INJURY LEVEL		
None	391	64
Injury - no hospitalization	186	31
Injury with hospitalization	23	4

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

Table A-8. - Continued

FORCE LEVEL	#	%
No threat	113	19
Threatened, no force used	126	21
Bodily force only	323	54
Weapon used	38	6

INJURY LEVEL BY VICTIM RESISTANCE

INJURY LEVEL	COOPERATIVE VICTIMS	RESISTANT VICTIMS
None	272	119
At least some	99	110
TOTAL	371	229

Source: See Table A-8. (Estimates based on a sample of 600 police reports)

MAJOR EXERCISE

Table A-9. Commercial Robbery Characteristics, 1977

MONTH OF OCCURRENCE	#	%
January	29	8
February	32	9
March	28	8
April	29	8
May	18	5
June	17	5
July	25	7
August	15	4
September	26	7
October	49	14
November	46	13
December	36	10
TIME OF DAY		
Midnight-6am	43	12
6am-noon	44	13
Noon-6pm	81	23
6pm-midnight	182	52
TYPE OF WEAPON		
Gun	278	79
Knife	31	9
Others	18	5
None	23	7
TYPE OF TARGET		
Grocery Store	48	14
Gas Station	63	18
Drug Store	19	5
Bar/Restaurant	17	5
Bank	6	2
Hotel/Motel	14	4
Other	183	52
LEVEL OF FORCE		
Weapon visible, not used	251	72
Physical force only	42	12
Weapon used	57	16
INJURY		
No injuries	304	87
Minor injury only	24	7
Hospital treatment	22	6

Source: See Table A-6. (Estimates based on a sample of 350 police reports)

Table A-10. Assaults (including Sexual Assaults), 1977

MONTH OF OCCURRENCE	#	%
January	143	8
February	131	7
March	137	8
April	142	8
May	168	9
June	148	8
July	141	8
August	146	8
September	166	9
October	139	8
November	165	9
December	174	10
TIME OF DAY		
2am-10am	253	14
10am-6pm	451	25
6pm-2am	1096	61
TYPE OF WEAPON		
Gun	325	18
Knife	305	17
Other	361	20
None	809	45
INJURY LEVEL		
None	593	33
Minor	559	31
Treated and Released	485	27
Hospitalized	163	9
VICTIM-OFFENDER RELATIONSHIP		
Strangers	631	35
Non-strangers	1169	65
VICTIM AGE		
Under 18	361	20
18-24	558	31
25-34	467	26
35-44	180	10
45-64	194	11
65 +	40	2

Table A-10. - Continued

VICTIM CHARACTERISTICS BY TYPE OF ASSAULT

VICTIM SEX	STRANGER TO STRANGER	NON-STRANGER
Male	474	503
Female	157	666
VICTIM AGE		
Under 18	89	272
18-24	201	357
25-34	187	280
35-44	41	139
45-64	95	99
65 +	18	22

Source: See Table A-6. (Estimates based on a sample of 1800 police reports)

Table A-11. Auto Theft Characteristics, 1977

TYPE OF VEHICLE	#	%
Auto	869	87
Trucks	51	5
Motorcycle	73	7
Other	7	1
TYPE OF PREMISE		
Parking Lot	432	43
Street Adjacent to Residence	218	22
Other Residential Street	119	12
Owner's Garage or Driveway	77	8
Other	154	15
LOCATION OF KEYS		
In owner's possession	789	79
In car	77	8
In ignition	64	6
Other	70	7
NEIGHBORHOOD WHERE VEHICLE RECOVERED		
Central	186	19
Westside	61	6
University	103	10
Park	474	47
Washington	14	1
Recovered out of city	84	8
Not recovered	98	10

Source: See Table A-6. (Based on a sample of 1000 police reports)

B. Attrition Rate of Cases in Chaos City

Table B-1. Chaos City, Adult Felony Case Processing Statistics

	1973	1974	1975	1976	1977
Adults Arrested	8524	10170	11075	11247	12498
Adults Filed On	5921	6072	5969	5489	5724
DA Refusals	2065	3193	3400	3880	4524
Victim Refusals	538	905	1706	1878	2250
Court Dismissals	1117	1159	1030	1102	1162
Deferred Prosecutions	196	234	199	259	275
Guilty Plea - As Charged	1834	1769	1849	1664	1587
Guilty Plea - Lesser Felony	1382	1291	1418	1372	1337
Guilty Plea - Misdemeanor	1068	1273	1130	888	778
Convictions By Trial	324	346	343	214	237
Trials	736	701	729	498	585

Source: Chaos City OBTS system (Includes homicides, rape, burglary, assault, theft)

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

Table B-2. Chaos City Arrests, Felony Filings and Case Dispositions, Violent and Property Crimes, 1976.

	VIOLENT CRIMES (Including Homicide, Rape Assault, Robbery)		PROPERTY CRIMES (Including Burglary, Theft)	
		% of Arrests		% of Arrests
Adults Arrested	4086		8412	
Adults Filed On	1886	46.2%	3838	45.6%
DA Refusals	2001	48.9%	2563	30.5%
Victim Refusals	1241	30.4%	1009	12.0%
Court Dismissals	432	10.6%	730	8.7%
Deferred Prosecutions	46	1.1%	229	2.7%
Guilty Pleas - As Charged	392	9.6%	1195	14.2%
Guilty Pleas - Lesser Felony	460	11.3%	877	10.4%
Guilty Pleas - Misdemeanor	419	10.3%	359	4.3%
Convictions by Trial	142	3.6%	95	1.1%
Trials	372	9.1%	213	2.5%

Source: See Table B-3.

Table B-3. 1976 UCR Disposition Data

	VIOLENT CRIME	PROPERTY CRIME
Adults Filed On	26,905	133,201
Guilty-As Charged	13,865	92,571
Guilty-Lesser Charge	3,096	7,849
Acquitted or Dismissed	9,977	32,781

Source: FBI, UCR, 1977. (Based upon 2793 cities - population 34 million)

MAJOR EXERCISE

Table B-4. Reasons for DA Case Refusal, 1973 and 1977.

Reason for Refusal	1973 #	1973 %	1977 #	1977 %
Evidence Problem				
Inadmissable evidence	372	18	1357	30
Unavailable physical evidence	103	5	226	5
Insufficient physical evidence	289	14	814	18
Witness Problem				
Unable to locate	41	2	91	2
Related/Friend of offender	62	3	181	4
Witness story/Credibility	310	15	226	5
Reluctant to get involved w/system	103	5	182	4
Prosecutorial Merit				
Multi-case disposition	165	8	271	6
Office policy	145	7	90	2
Diversion program	248	12	995	22
Unknown	227	11	91	2
Total	2065	100%	4524	100%

Source: Chaos City District Attorney's Office 197[illegible] (Based on a sample of cases in 1973 and 1977).

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

Table B-5. Chaos City Criminal Justice System Staffing

	1973	1974	1975	1976	1977
District Attorneys (Staff Attorneys)	49	49	53	53	53
Judges	27	27	31	31	31
Police Officers	386	386	396	396	412

Source: Chaos City, Office of the Budget, 1978

MAJOR EXERCISE

Table C-1. Two Year Cohort Study of Recidivism
By Selected Characteristics and Original Commitment Offense

Original Commitment Offense	Number of Cases	Rearrested	Not Rearrested	Reconvicted	Not Reconvicted
	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
Assault	40	10 (25%)	30 (75%)	6 (15%)	34 (85%)
Rape	25	4 (16%)	21 (84%)	4 (16%)	21 (89%)
Robbery	61	32 (52.5%)	29 (47.5%)	17 (27.9%)	44 (72.1%)
Burglary	75	44 (58.7%)	31 (41.3%)	25 (33.3%)	50 (66.7%)
Theft	49	30 (61.2%)	19 (38.8%)	22 (44.9%)	27 (55.1%)

Number of Prior Felony Arrests (Including that which resulted in original commitment)	Number of Cases	Rearrested	Not Rearrested	Reconvicted	Not Reconvicted
	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
None or None Known	85	31 (36.5%)	54 (63.5%)	15 (17.6%)	70 (82.4%)
One	72	32 (44.4%)	40 (55.6%)	18 (25%)	54 (75%)
Two	41	23 (56.1%)	18 (43.9%)	14 (34.1%)	27 (65.9%)
Three	23	15 (65.2%)	8 (34.8%)	9 (39.1%)	14 (60.9%)
Four	13	9 (69.2%)	4 (30.8%)	8 (61.5%)	5 (38.5%)
Five	7	4 (57.1%)	3 (42.9%)	4 (57.1%)	3 (42.9%
Six or More	9	6 (66.7%)	3 (33.3%)	6 (66.7%)	3 (33.3%)

Table C-1. Continued

	Number of Cases	Rearrested	Not Rearrested	Reconvicted	Not Reconvicted
History of Substance Abuse	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
Alcohol Abuse History	75	34 (45.3%)	41 (54.7%)	24 (32%)	51 (68%)
Drug Abuse History	55	27 (49.1%)	28 (50.9%)	18 (32.7%)	37 (67.3%)
Combination	23	13 (56.5%)	10 (43.5%)	10 (43.5%)	13 (56.5%)
None	97	46 (47.4%)	51 (52.6%)	22 (22.7%)	75 (77.3%)
Post-Release Employment Status (2 months after release)	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
Employed Part-time	43	20 (46.5%)	23 (53.5%)	12 (27.9%)	31 (72.1%)
Employed Full-time	142	57 (40.1%)	85 (59.9%)	31 (21.8%)	111 (78.2%)
Unemployed	65	43 (66.1%)	22 (33.9%)	31 (47.7%)	34 (52.3%)
Total number of jobs during 2-year follow-up	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
None	42	28 (66.7%)	14 (33.3%)	18 (42.9%)	24 (57.1%)
One	83	29 (34.9%)	54 (65.1%)	17 (20.5%)	66 (79.5%)
Two	71	34 (47.9%)	37 (52.1%)	21 (29.6%)	50 (70.4%)
Three or more	54	29 (53.7%)	25 (46.3%)	18 (33.3%)	36 (66.7%)

MAJOR EXERCISE: CHAOS CITY
(GROUP C)

Table C-1. Continued

	Number of Cases	Rearrested	Not Rearrested	Reconvicted	Not Reconvicted
Average Annual Income Level During Followup Period	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
$2,000	45	23 (51.1%)	22 (48.9%)	14 (31.1%)	31 (68.9%)
$2,001 - $4,000	91	45 (49.5%)	46 (50.5%)	27 (29.7%)	64 (70.3%)
$4,001 - $6,000	59	29 (49.2%)	30 (50.8%)	18 (30.5%)	41 (69.5%)
$6,001 - $8,000	31	14 (45.2%)	17 (54.8%)	8 (25.8%)	23 (74.2%)
$8,001 - $10,000	20	9 (45.0%)	11 (55.0%)	7 (35.0%)	13 (65.0%)
$10,000	4	0 (0%)	4 (100%)	0 (0%)	4 (100%)
Number of Known Residences During Followup Period	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
One	87	35 (40.2%)	52 (59.8%)	23 (26.4%)	64 (73.6%)
Two	91	42 (46.2%)	49 (53.8%)	27 (29.7%)	64 (70.3%)
Three	49	26 (53.1%)	23 (46.9%)	17 (34.7%)	32 (65.3%)
Four or More	23	17 (73.9%)	6 (26.1%)	7 (30.4%)	16 (69.6%)

MAJOR EXERCISE: CHAOS CITY
(GROUP C)

Table C-1. Continued

	Number of Cases	Rearrested	Not Rearrested	Reconvicted	Not Reconvicted
Sex and Ethical Background	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
White Male	94	47 (50%)	47 (50%)	30 (31.9%)	64 (68.1%)
Other Male	61	34 (55.7%)	27 (44.3%)	20 (32.8%)	41 (67.2%)
White Female	63	24 (38.1%)	39 (61.9%)	16 (25.4%)	47 (74.6%)
Other Female	32	15 (46.9%)	17 (53.1%)	8 (25%)	24 (75%)
Age	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
18 - 21	62	37 (59.7%)	25 (40.3%)	22 (35.5%)	40 (64.5%)
22 - 25	49	29 (59.2%)	20 (40.8%)	17 (34.7%)	32 (65.3%)
26 - 29	31	16 (51.6%)	15 (48.4%)	11 (35.5%)	20 (64.5%)
30 - 33	33	22 (66.7%)	11 (33.3%)	11 (33.3%)	22 (66.7%)
34 - 37	20	6 (30%)	14 (70%)	5 (25%)	15 (75%)
38 - 41	36	8 (22.2%)	28 (77.8%)	6 (16.7%)	30 (83.3%)
Over 42	19	2 (10.5%)	17 (89.5)	2 (10.5%)	17 (89.5%)
Type of Sentence Received Under Previous Offense	250	120 (48%)	130 (52%)	74 (29.6%)	176 (70.4%)
Probation	72	25 (34.7%)	47 (65.3%)	17 (23.6%)	55 (76.4%)
Less Than One Year	123	61 (49.6%)	62 (50.4)	37 (30.1%)	86 (69.9%)
Greater Than One Year	55	34 (61.8%)	21 (38.2%)	20 (36.4%)	35 (63.6%)

Source: Paradise University, Criminal Justice Research Center, 1978.

MAJOR EXERCISE

Table C-2. Multiple Rearrests by Original Commitment Offense

Number of Rearrests (Two-year Follow-up)	Original Commitment Offense				
	Assault	Rape	Robbery	Burglary	Theft
None	30	21	29	31	19
One	5	2	8	10	4
Two	3	1	7	14	4
Three	----	----	8	11	9
Four	2	----	4	5	6
Five	----	1	5	4	7
	N = 40	N = 25	N = 61	N = 75	N= 49

Source: See Table C-1.

Table C-3. Type of Rearrest by Original Commitment Offense

Type of Rearrest	Rape	Robbery	Assault	Burglary	Theft
Rape	9	----	----	2	----
Robbery	1	55	5	2	----
Assault	5	7	16	1	2
Burglary	----	----	-----	97	19
Felony Theft	----	3	9	13	59
Misdemeanor	----	-----	2	11	5
Victimless	----	-----	-----	1	-----
Total	15 N = 25	65 N = 61	32 N = 40	127 N = 75	85 N = 49

Footnote: The number of rearrests is greater than 120 since the average recidivist is rearrested 2.7 times.

Source: See Table C-1.

MAJOR EXERCISE: CHAOS CITY
(GROUP C)

Table C-4. Chaos City Felony Arrest Statistics

Number of Prior Adult Arrests	1973		1974		1975		1976		1977	
	#	%	#	%	#	%	#	%	#	%
0	4347	51%	4882	48%	4984	45%	4724	42%	4999	40%
1	1875	22%	1932	19%	1883	17%	1687	15%	1999	16%
2	938	11%	1220	12%	1329	12%	1124	10%	1750	14%
3	512	6%	814	8%	886	8%	562	5%	625	5%
4	426	5%	407	4%	554	5%	1238	11%	750	6%
5	256	3%	509	5%	774	7%	1013	9%	1250	10%
6+	170	2%	406	4%	665	6%	899	8%	1125	9%
Total	8524	100%	10170	100%	11075	100%	11247	100%	12498	100%

Note: This table reflects the distribution of all felony arrests for the years from 1973 through 1977.

Source: See Table C-1.

MAJOR EXERCISE

GLOSSARY

PREFACE

This glossary is designed both to serve as a common point of reference for terminology used in the Criminal Justice Training Center (CJTC) courses and to enhance communication among practitioners on the job. It was developed by the LEAA Training Division, Office of Operations Support using input from the developers of the planning, analysis, monitoring, and evaluation courses, CJTC staff and instructors, and several LEAA Offices. As the language evolves, so will this glossary. It will be reviewed and updated each time a new course is added to the series. Your comments are invited and will be considered during each revision.

Training Division,
Office of Operations Support
April, 1978

FORMAT

The format used here was devised in an attempt to accomodate variation in philosophy and approach. Please note that in some instances, the common, interdisciplinary definition (1.) has been omitted because the term is frequently used in everyday language. In other instances, the criminal justice system and CJTC course definition (2.) has been omitted because it is the same as the interdisciplinary definition.

KEY

1. Common interdisciplinary or broad definition.

2. Definition within the context of the criminal justice system and Criminal Justice Training Center courses.

3. Related terms defined in this glossary, but not mentioned in above definitions, that may contribute to a clearer understanding of the meaning. (Also note that all terms defined here are underlined where they are used, as defined, in the definition of another term.)

DEFINITIONS

ACTIVITIES
2. The operations and processes of a project; how project inputs are put to use; what people do in the context of the project.

ANALYSIS
1. A process of hypothesis formulation, data specification, data collection, data manipulation, and extraction of information.
2. In the analysis course: a systematic, sequential process comprised of problem formulation, data collection, the interpretation of data, and the presentation of information for the purpose of influencing decision-making. In evaluation: the examination of data, most often by quantitative methods, to discover the nature of the data and the relationships among variables so as to allow for judgments on the program or project.

ANALYSIS PLAN
1. A written document or oral presentation which systematically outlines or describes a sequence of events and procedures for conducting an analysis.

ASSESSMENT
1. The most general term used by LEAA for a broad range of activities conducted for the purpose of defining what is happening, its importance and value. It includes evaluation, monitoring, and self-assessment, as well as judgments on programs and projects not based on systematic data collection.
3. FORMATIVE EVALUATION, IMPACT ASSESSMENT, INTENSIVE EVALUATION, PERFORMANCE MEASUREMENT, PROCESS EVALUATION, PROGRAM REVIEW, PROJECT REVIEW, SUMMATIVE EVALUATION.

ASSUMPTION
1. A given; a supposition upon which an hypothesis is formulated; also, a technical assumption refers to the distributional, scalar, and other properties of data which influence the choice of appropriate statistical techniques.

ATTRIBUTION
2. The act of ascribing some result, event, behavior, or outcome to a program, project, or its components.

CAPABILITY, MEASURES OF
2. System measures obtained by dividing available measures of resources by measures of workload requirements, usually expressed as a rate.

CLEARANCE RATE
2. The ratio of crimes "solved" by the arrest of probable offenders, to crimes reported.
3. RATE, RATE DETERMINANTS, SYSTEM RATES.

CLINICAL METHOD
1. An evaluation method that examines project cause-effect relationships by the systematic, logical, case-by-case analysis of project events and/or clients.
3. COMPARATIVE METHOD, CORRELATIONAL METHOD

COMPARATIVE METHOD
1. An evaluation method that examines project cause-effect relationships by comparing one project or intervention against another or against pre-project baseline data.
3. CLINICAL METHOD, CORRELATIONAL METHOD.

COMPARISON GROUP
1. Any non-treatment group similar to the treatment group but not randomly formed, nor necessarily identical with respect to all control variables.
3. CONTROL GROUP, SAMPLE, SIMPLE RANDOM SAMPLE, STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE.

COMPONENT
2. An agency or process which is a part of the criminal justice system. "the courts" and "arrest" are components of the criminal justice system.

CONCERN
2. The vague and/or frequently unspecified hunches and/or attitudes about aspects of crime and the Criminal Justice System.

CONCEPT
2. A distinguishable component found or expressed within a concern.

CONFIDENCE INTERVAL
1. The range of values within which a population parameter is expected to lie, given a certain level of confidence.
3. CONFIDENCE LEVEL.

CONFIDENCE LEVEL
1. The probability that a confidence interval includes the population parameter or that observed differences between two groups are not due to chance variation.
3. CONFIDENCE INTERVAL, STATISTICAL SIGNIFICANCE.

CONTINGENCY PLANNING
1. Designing plans to provide program or project continuity or goal achievement in the event of the occurrence of unlikely events.
3. PLANNING

CONTROL GROUP
1. A non-treatment group which is randomly formed and assumed to be identical to the treatment group with respect to all control variables including the treatment variable.
3. COMPARISON GROUP, SAMPLE, SIMPLE RANDOM SAMPLE, STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE.

CORRELATION
1. A type of statistical analysis used in relationship studies. Such studies investigate the extent to which two or more variables vary systematically in a population.

CORRELATIONAL METHOD
1. An evaluation method that examines project relationships on the basis of within-project variability.
3. CLINICAL METHOD, COMPARATIVE METHOD.

COST-BENEFIT ANALYSIS
1. The application of any of several techniques, mostly quantitative, for comparing, among alternative projects and plans, total estimated dollar cost to the total estimated dollar value of the benefits which will be derived.
3. COST-EFFECTIVENESS ANALYSIS

COST EFFECTIVENESS ANALYSIS
1. The application of any one of several techniques, mostly quantitative, for comparing, among alternative projects and plans, the total estimated dollar cost to the estimated change in level of performance in one or more areas. In this type of analysis, effectiveness measures are usually non-monetary.
3. COST BENEFIT ANALYSIS

CRIME-SPECIFIC
2. A term used to differentiate from crime in general. For example, a burglary program would be crime-specific, whereas a community crime prevention program would not.

CRIMINAL JUSTICE SUB-SYSTEM
2. A component of the criminal justice system that consists of a collection of interdependent agencies that perform a complex sequence of activities. The four major components are police, prosecution, courts, and correction. The outputs of one component may be the inputs of another.

CRIMINAL JUSTICE SYSTEM
1. All agencies and processes, both official and unofficial, which deal primarily with crime and criminals.
2. The set of interrelated agencies that performs a series of complex operations, in sequence, in response to criminal acts. It is composed of all criminal justice sub-systems.

CRITICAL PATH METHOD (CPM)
1. A technique by which the shortest or least expensive path through a PERT chart can be found. The necessary events which fall in sequence along the critical path become important milestones for a program or project.

DATA
1. Measures of activities, events, behaviors, outcomes, opinions, etc. Data may be quantitative or qualitative form and may range from counts of people or events, to statements of opinion.
3. DATA ELEMENTS, INFORMATION

DATA COLLECTION PLAN
1. A list of variables, measures, data sources, data collection procedures, costs, and timetables.

DATA ELEMENTS
1. The specific, usually quantitative, counts, scores, events, etc. which are combined and summarized to produce data.
3. MEASUREMENT

DECISION POINT
2. A critical point where a decision regarding policy, programming or the processing of individuals is made.

DECISION POINT PERCENTAGE
2. A percentage obtained by dividing the number of cases assigned to an alternative at a decision point by the total number of cases which have arrived at that point. For example, if the choices for a sentencing court are prison and probation, 1000 cases are to be sentenced, and the choice is probation for 800 and prison for 200, then the decision point percentage for probation is 80% (800 1000 x 100) and the decision point percentage for prison is 20% (200 1000 x 100).
3. DECISION POINT, SYSTEM RATES

DECISION TREE
1. A network representation of sequences of actions and their consequences. Each possible decision and each of its consequences is shown by a different path through the tree. A disposition tree is a type of decision tree.

DELPHI TECHNIQUE
1. A procedure for focusing several experts' opinions about a topic by obtaining the opinions of each, presenting all opinions obtained to each participant without identifying the source, obtaining a second round of opinions (supposedly influenced by the first), and repeating the process until consensus is reached.

DEPENDENT VARIABLE
1. A characteristic or event variable which is hypothesized to change as a result of changes in another variable.
3. INDEPENDENT VARIABLE

EVALUABILITY
1. Project conditions which allow for collection, analysis, and report of relevant data for the assessment of achievement of all levels of objectives within the time frame needed by decision-makers.

EVALUATION
1. A process for making judgements about selected activities, populations, events policies, or other factors relevant to management decisions, by systematically comparing them to criteria that have been specified in either qualitative or quantitative terms.
2. "...the administration and conduct of studies and analyses to determine the impact and value of a project or program in accomplishing the statutory objectives of the Title." (Crime Control Act of 1976)
3. FORMATIVE EVALUATION, IMPACT ASSESSMENT, INTENSIVE ELALUATION, MONITORING, PROCESS EVALUATION, SUMMATIVE EVALUATION.

EVALUATION DESIGN
1. The conceptual framework, method of assessment, measurements, and analyses to be used in determining the efficiency of effectiveness of the component, service, program, project, or policy being studied.
3. EVALUABILITY, RESEARCH DESIGN.

EVALUATION METHOD
1. A general description of the approach (clinical, correlational, or comparative) that can be taken to examine specified, probable cause-effect relationships of a project. An evaluation method is not the same as a statistical technique used to analyze evaluative data.
3. CLINICAL METHOD, CORRELATIONAL METHOD, COMPARATIVE METHOD.

EXPERIMENTAL DESIGN
1. A subset of evaluation designs in which the assignment of groups to a treatment is according to sound probalistic and statistical practice.
3. PRE-EXPERIMENTAL, QUASI-EXPERIMENTAL

FEEDBACK
1. Information concerning the perfermance or result of an action, which can be used to affect a subsequent performance of the same action.

FIELD DEMONSTRATION
2. A stage in the program developement process, following testing, during which the tested project design is installed at a number of sites in order to impact on a particular problem and so that more may be learned about the project design as it operates at those sites.

FLOWCHART
1. A graphic representation in which symbols are used to represent operation, data, decision points, direction of movements, etc.

FORECASTING
1. Projecting or estimating some future event or condition. Forecasting identifies the most probable course or range of possibilities.

FORMATIVE EVALUATION
1. A type of assesment, focusing on activities and results, which aids in the development of a program or project.
3. ASSESSMENT, PROCESS EVALUATION, SUMMATIVE EVALUATION.

GOAL
1. A desired future state; plans expressed as results to be achieved, usually general and not time-limited.
3. OBJECTIVE

HYPOTHESIS
1. A specific statement about assumed relationships between specified variables. Hypotheses are often restated as the relationship between program or project activities and objectives.

IMPACT ASSESSMENT
1. A type of evaluation that focuses on determining whether or not program or project interventions are related to subsequent outcomes or changes in the problem addressed and that seeks to determine whether or not the changes can be attributed to the program or project interventions.
3. INTENSIVE EVALUATION

INDEPENDENT VARIABLE
1. A characteristic, trait, attribute, or event, the alteration of which may produce changes in another characteristic, trait, attribute, or event.
3. DEPENDENT VARIABLE, VARIABLE

INFERENTIAL STATISTICS
1. Statistical techniques applied to characteristics of a sample of the purpose of making inferences about a population which has characteristics similar to those of the sample. Inferential statistics typically require high standards of data reliability and validity.

INFERENCE
1. The act of passing from statistical sample data to generalizations, usually with calculated confidence levels; the act of passing from one proposition, statement, or judgement considered as true, to another whose truth is believed to follow logically from that of the former.

INFORMATION
1. The product of data obtained and analyzed: evidence for or against hypotheses; evidence regarding the achievement of objectives, for use in making decisions about programs and projects.
3. DATA

INPUT PERCENTAGE
2. A system rate obtained by dividing the number of cases at some decision point in the criminal justice system by the total number of cases which have entered the system. For example, if 10,000 cases enter the system, and 600 are placed on probation, the input percentage would be 6% (600 10,000 x 100). This percentage is also a rate of use; probation is used for 6% of the cases entering the system.
3. DECISION POINT, DECISION POINT PERCENTAGE

INPUTS
2. All the resources needed for a project to work; the "people and things" of a project; data elements needed to generate the output of analysis.

INTENSIVE EVALUATION
1. The systematic measurement of project inputs, activities, results, and outcomes in an attempt to determine causal relationships between project inputs, activities, results, and outcomes.
3. EVALUATION, IMPACT ASSESSMENT

INTERVENING VARIABLE
1. An event, entity, characteristic, process, or variable which intervenes and connects the independent variable with the dependent variable, and becomes, in effect, responsible for variations in the dependent variable.

INTERVENTION
1. A set of specifically, and clearly, defined activities designed to produce a specific positive change in a specific problem area.

KEY EVENTS
2. Those inputs, activities, results, and outcomes that have been identified through the method of rationales as being crucial to the success of the program or project.
3. KEY EVENTS ANALYSIS

KEY EVENTS ANALYSIS
2. A tool for examining key events to determine the elements of which they are composed; can be utilized as the basis upon which the evaluation design is constructed.

MBO (MANAGEMENT BY OBJECTIVES)
1. An approach to management whereby broad goals are defined, specific objectives for a limited time period are set, and movement toward the objectives is periodically appraised. It is a rational, coordinative, and resource-oriented process.

MANDATE
1. A legislative or administrative edict.

MEASURE
2. An observable qualitative or quantitative indicator used as a standard or comparison.

MEASUREMENT
1. The systematic collection of observation that serve as indications or representations of specific activities, behaviors, events, effects, or relationships, usually by means of quantitative techniques. Measurement techniques range from simple counting to complex statistical procedures used to indicate relationships.
3. DATA, DATA ELEMENTS

MEASUREMENT ACCURACY
2. The degree to which variations in validity and reliability cause error in measurement.

METHOD OF RATIONALES
2. A tool or format that specifically outlines program or project inputs and activities, the results expected from those inputs and activities, and the outcomes to be generated by the inputs, activities, and results. The method of rationales is intended to disclose the logic that links each time or event through to the outcome.
3. KEY EVENTS, KEY EVENTS ANALYSIS

MISSION
1. The general purpose of an organization; its reason for existing.

MONITORING
1. A type of evaluation which, through continuous review, attempts to establish whether or not inputs are sufficient to produce intended activities and whether or not the activities actually occuring are those which are intended.
3. FORMATIVE EVALUATION, PROCESS EVALUATION

MODEL
1. A qualitative or quantitative representation, either physical or symbolic, of the relationships within a set of measures or system components that describes or permits reasonable inferences about the probable outcomes for a range of different inputs or changes in operating conditions.
2. A set of recommended conditions desired for a project or program, that are believed to support the achievement of the corresponding criminal justice system goals or objectives.
3. HYPOTHESIS, METHOD OF RATIONALES

NORMATIVE PLANNING
1. Designing plans at the policy-making level, that are oriented toward what should be done and why. It is responsive to broad, long-term goals and basic community values and serves to define and orient agency missions. Also called "policy planning."
3. OPERATIONAL PLANNING, PLANNING, STRATEGIC PLANNING

OBJECTIVE
1. A specific condition to be attained by a specific set of activities, stated in time-limited and measureable terms.
3. GOAL, MISSION

OPERATIONAL PLANNING
1. Designing plans to specify what will be done, by whom, when, and with what resources, and the details of program and project schedules, personnel, budgets, etc.
3. NORMATIVE PLANNING, PLANNING, STRATEGIC PLANNING

OUTCOMES
2. Planned or unplanned changes in the problem conditions addressed that result from program or project interventions.
3. RESULTS

PARAMETER
1. A quantity (such as a mean) that describes a statistical population or relationship. Also, frequently used to describe the variables to be included in a study or analysis.

PERFORMANCE MEASURE
1. A precise criterion statement used to evaluate activities in relation to objectives and goals; it may be either quantitative, qualitative, or both.

PERFORMANCE MEASUREMENT
1. Systematic program and project assessments, including self-assessment, monitoring, and evaluation.

PERFORMANCE OBJECTIVE
1. A specific, measurable standard, to be attained during the conduct of a project activity, that is necessary to achieve a project objective.
3. OBJECTIVE, PROJECT OBJECTIVE

PERT (PROGRAM EVALUATION AND REVIEW TECHNIQUE)
1. Defines a program or project in terms of a network of interdependent events, typically shown on a flowchart.
3. CRITICAL PATH METHOD

PLANNING
1. The orderly, systematic, and continuing process of bringing anticipations of the future to bear on current decision-making.

POLICY
1. A definite course of action or thought which is selected from among alternative, goals and strategies in light of given conditions, to guide and determine present and future decisions.

PRE-EXPERIMENTAL DESIGN
1. A way of organizing and conducting evaluations without using comparison groups or control groups.
3. QUASI-EXPERIMENTAL DESIGN, TRUE EXPERIMENTAL DESIGN

PRIMARY DATA
2. Data which must be collected for a particular analysis effort. It is generally not currently available in easily usable form but can be obtained by conducting surveys and polls or from records and reports.
3. SECONDARY DATA

PROBABILITY
1. A mathematical estimate, ranging from zero (0.00) to one (1.00), of the likelihood that an observed relationship is true and not due to chance, or that a predicted event will occur.
3. CONFIDENCE LEVEL, STATISTICAL SIGNIFICANCE.

PROBLEM
2. Any present or future condition or situation which deviates from a NORM or standard which is acceptable to a given community, and which is based on valid and reliable information.

PROBLEM FORMULATION
2. The generation and elaboration of a set of questions requiring definition and measurement, and which typically arise from broad, general topics or current events.
3. ANALYSIS

PROBLEM STATEMENT
1. A written doucment and /or oral presentation which comprehensively describes the magnitude, seriousness, rate of change and personal, spatial and temporal aspects of a problem using qualitative information; identifies the nature, extent and effect of system response; makes projections based on historical inference; and, rigorously attempts to establish the causes of the problem.

PROBLEM SPECIFICATION
1. Consists of 1). the identification of concerns; 2). the elaboration of concepts, variables, and measures; 3). postulating hypotheses.

PROCESS EVALUATION
1. A type of evaluation that focuses on the relationships among project inputs, activities, and results, and is used to improve the effectiveness of on-going projects.
3. FORMATIVE EVALUATION, MONITORING

PROGRAM
1. A set of related efforts, under a common, general authority, that is designed to address a particular problem. A program usually consists of a collection of projects which may address the same or different concerns.

PROGRAM REVIEW
2. The gathering and assessment of monitoring information at a particular point in time. Program reviews are intended to identify design and implementation issues and to provide information useful for management, restructuring, compliance, and development of similar programs.
3. PROGRAM, PROJECT REVIEW

PROJECT
1. A planned intervention at one or more sites, which under the direction of a specific manager and that operationalizes a set of closely related activities. A single project may constitute a program, or it may be only one part of a program.
3. PROGRAM

PROJECTION
1. An estimate of some future condition based on a study of past and current conditions and trends. Such estimates may be either quantitatively or qualitatively derived and stated.
3. FORECASTING

PROJECT OBJECTIVE
1. A specific condition anticipated to occur as a result of a planned intervention through the application of project resources and activities to a problem.
3. OBJECTIVE, PERFORMANCE OBJECTIVE

PROJECT REVIEW
2. Individual project assesments at a particular point in time.
3. PROGRAM REVIEW

QUASI-EXPERIMENTAL DESIGN
1. A way of organizing and conducting evaluations in which comparisons are based on similar, but not randomly formed groups.
3. COMPARISON GROUP, PRE-EXPERIMENTAL DESIGN, SIMPLE RANDOM SAMPLE, STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE, TRUE EXPERIMENTAL DESIGN

RATE
1. An analytical tool which permits measurement against common denominators and allows for relevant comparisons.
3. CLEARANCE RATE, DECISION POINT PERCENTAGE, INPUT PERCENTAGE, RATE DETERMINANTS, SYSTEM RATES

RATE DETERMINANTS
2. Those variables which impact upon or influence the system rates.
3. INDEPENDENTS, VARIABLE RATE

REGRESSION ANALYSIS
1. A statistical technique used to study the quantitative relationship between two variables in order to determine whether or not the dependent variable can be reliably estimated from the known value of the independent variable.

REGRESSION TOWARD THE MEAN
1. The fact that when a high degree of variability exists over time, and any extreme value of a variable is selected, the next value is likely to be closer to the mean.

RELIABILITY
1. The probability that a given measure or measurement procedure will give consistently similar results (data) over time, in the absence of real change in what is being studied.
3. VALIDITY

RESEARCH DESIGN
1. The component of an analysis, evaluation, or research plan that specifies variables, parameters, measures, and analysis procedures designed to answer the questions to which the study is addressed.
2. The component of the evaluation framework that specifies who receives treatment, when treatment is given, who is observed, and when observations are made.
3. ANALYSIS PLAN, EVALUATION DESIGN

RESOURCES, MEASURES OF
2. Measures of workforce, equipment, facilities, budget, and time.
3. CAPABILITY, WORKLOAD

RESULTS
2. The effect of project inputs and activities on operational performance.
3. OUTCOME

SAMPLE
1. A limited number of cases, persons, groups, organizations, areas, or other units selected from a larger population.
3. SIMPLE RANDOM SAMPLE, STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE

SAMPLING ERROR
1. Errors in obtained data due to chance variation. This should not be confused with "sampling bias," which is an inadequate representation of the population.

SECONDARY DATA
2. Data which have already been collected in conjunction with other analyses and are currently in easily usable form.
3. PRIMARY DATA

SELF-ASSESSMENT
2. Systematic collection and analysis of data by project staff, leading to a qualitative or quantitative conclusion.
3. ASSESSMENT

SIMPLE RANDOM SAMPLE
1. An unbiased sample in which each individual unit in the population has an equal chance of being selected. Each selection is independent of every other selection.
3. STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE

STATISTICAL SIGNIFICANCE
1. At a given confidence level, signifies that observed differences between two or more measures are probably not due to chance or random variation.

STRATEGIC PLANNING
1. Planning that is concerned with the identification of alternative approaches to problems, formulation of programs and contingency plans, and the development of guidelines for tactical and operational planners. Focuses on what can be done and how.
3. SYSTEMATIC SAMPLE

SUMMATIVE EVALUATION
1. An evaluation approach in which an assessment of the worth or utility of a program or project is sought after it has been in operation for a period of time and is no longer subject to developmental changes.
3. FORMATIVE EVALUATION

SYSTEM RATES
2. Statements, in mathematical form, expressing the efficiency or effectiveness of the criminal justice system at its various levels of functioning. These data are normally presented as input percentages or decision point percentages.
3. RATE

SYSTEMATIC SAMPLE
1. A sample obtained by selecting every n^{th} unit from a list of all units in the population. The size of the interval between units ("n") is the number of units on the list divided by the desired sample size. The initial case to be included in the sample is selected randomly.
3. FIELD DEMONSTRATION

TRUE EXPERIMENTAL DESIGN
1. A subset of evalutation designs in which the assignment of groups to treatment is random.
3. CONTROL GROUP, PRE-EXPERIMENTAL DESIGN, QUASI-EXPERIMENTAL DESIGN, SIMPLE RANDOM SAMPLE, STRATIFIED RANDOM SAMPLE, SYSTEMATIC SAMPLE.

VALIDITY
1. The degree to which a result or measure actually reflects what it purports to measure. Validity as defined here concerns measurement (data) or instrument validity and should not be confused with validity threats or with reliability.

VALIDITY THREATS
1. An alternative explanation, other than project activities, for an observed effect.

VARIABLE
1. A characteristic, trait, attribute, or event having more than one possible value.
3. PARAMETER

WORKLOAD, MEASURES OF
2. Measures of the amount of work to be done and of the relative importance of different work catagories.
3. CAPABILITY, RESOURCES.

END