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U.S. Department of Justice
Law Enforcement Assistance Administration

Criminal Justice Planning and Management Series

Volume 2

Criminal Justice Analysis Course:

Instructor Guide

79355



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 80 minutes.

ORIENTATION SCHEDULE

TIME ALLOCATION

TOPIC	TIME	PAGE
I. PURPOSE OF ORIENTATION.....	5 minutes	0 - 2
A. Facility and Area		0 - 2
B. Logistics		0 - 2
C. Aquaint Participants		0 - 2
II. THE FACILITY AND AREA.....	5 minutes	0 - 2
A. Hotel		0 - 2
B. Restaurants, etc.		0 - 2
III. ADMINISTRATIVE MATTERS.....	10 minutes	0 - 2
A. Break Policy		0 - 2
B. Room Set-up		0 - 2
C. Dress		0 - 2
D. Travel Vouchers		0 - 2
E. Credit		0 - 3
F. Evaluation		0 - 3
IV. CRIMINAL JUSTICE TRAINING CENTER.....	*	0 - 3
A. University		0 - 3
B. LEAA		0 - 3
C. Audience		0 - 3
V. STAFF AND FACULTY.....	5 minutes	0 - 4
A. Backgrounds		0 - 4
B. Academic/Experience		0 - 4
VI. PARTICIPANTS.....		0 - 4
A. Roster Corrections	*	0 - 4
B. Method of Selection	*	0 - 4
C. Introductions	20 minutes	0 - 4
D. Group Characteristics	*	0 - 4
VII. COURSE MATERIAL.....	5 minutes	0 - 4
A. Participant Guide		0 - 4
B. Visuals		0 - 4
C. Glossary and Bibliography		0 - 4
TOTAL TIME	50 minutes	

* 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

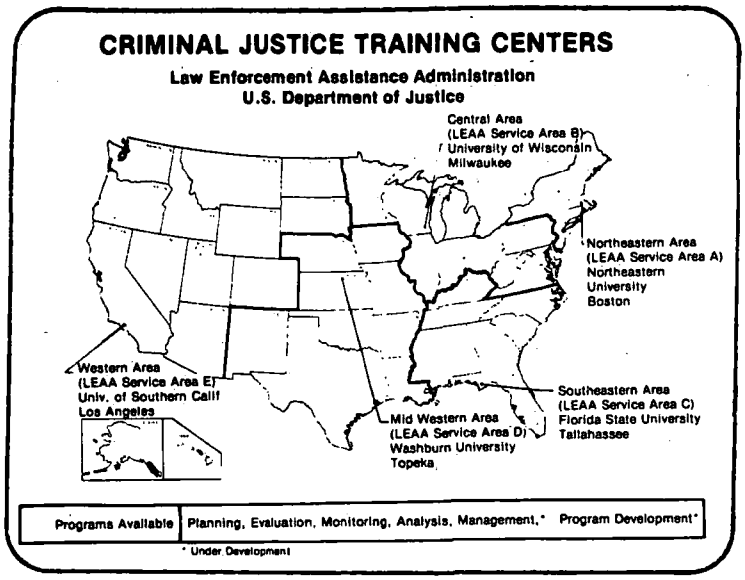
IV. CRIMINAL JUSTICE TRAINING CENTER

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

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

---

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. (Note: This technique is a very effective ice breaker but it can tend to be time consuming. The manager should be alert to this risk).

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.

OBJECTIVES

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.

TIME ALLOCATION

TOPIC	TIME	PAGE
I. COURSE OVERVIEW	30 minutes	IN-3
A. Course Goals	5 minutes	IN-3
B. Course Participants	5 minutes	IN-3
C. Course Themes	5 minutes	IN-4
D. Values or Purposes of Analysis	10 minutes	IN-5
E. Process as Roadmap	5 minutes	IN-7
TOTAL TIME	30 minutes	

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

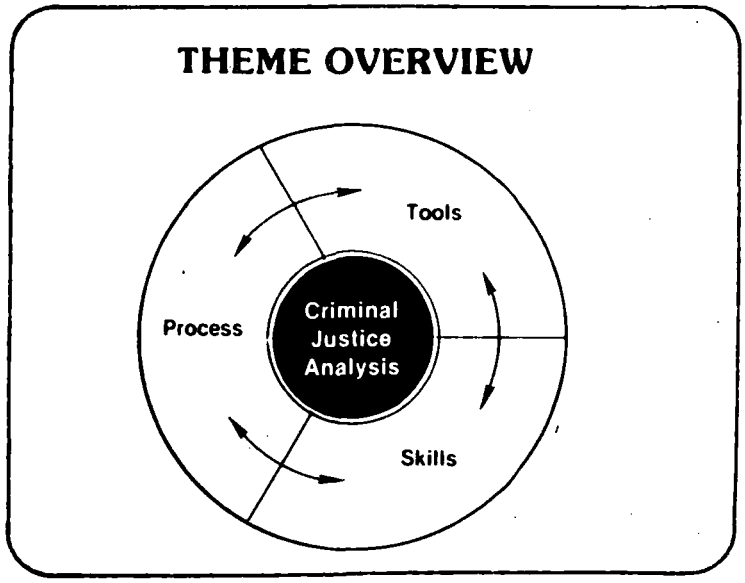
1. The introductory nature and goals of the course indicate that it is for those who seek to understand the analysis process and gain knowledge of how to apply basic analytical tools used in formulating crime and criminal justice system problems.

2. The participants should include planners, budget analysts, program coordinators, policy analysts, program developers, program monitors - anyone that informs decision-makers 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: Guideline Manual: State Planning Agency Grants, M 4100.1S, Jan. 18, 1977, including changes 1, 2, and 3. LEAA, United States Dept. of Justice, Chapter 3, TD Comprehensive Plan, Section 4, Analysis of Problems and Development of Problem Statement, pp.34-38.)

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

      (1) If the 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 the 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:

   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).

a. Data Collection and Interpretation

b. Technical Assistance

c. Written Communication

d. Oral Communication

e. Formal and Informal Communication

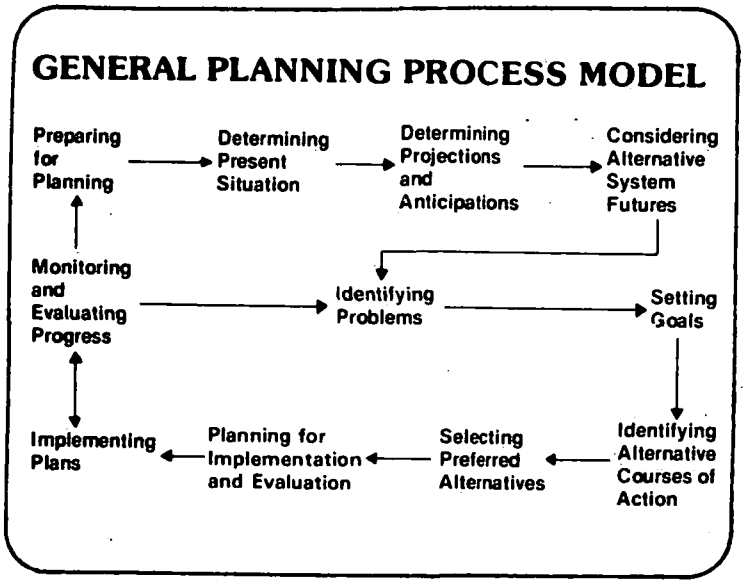
f. Interpersonal Skills

g. Leadership

h. Decision-Making Influence

3. Analysis is an Integral Part of Planning Process

SHOW V.A. (IN-2):

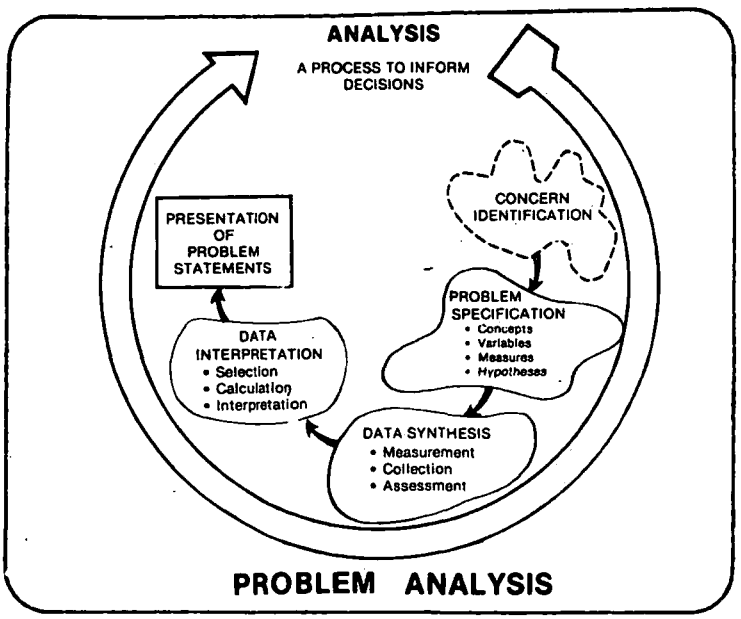


EMPHASIZE (IN-2):

+ 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 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. Circle for Module

   d. Triangle for product or outcome.

   e. Arrows will indicate the direction of the flow.

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

5. Exhibit 2 is the course agenda.

   a. CJTC should insert actual schedule. The one provided is a guide based on suggested module and exercise times.

   b. 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.

c. The course has approximately 35 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.

Exhibit 1. Course Overview

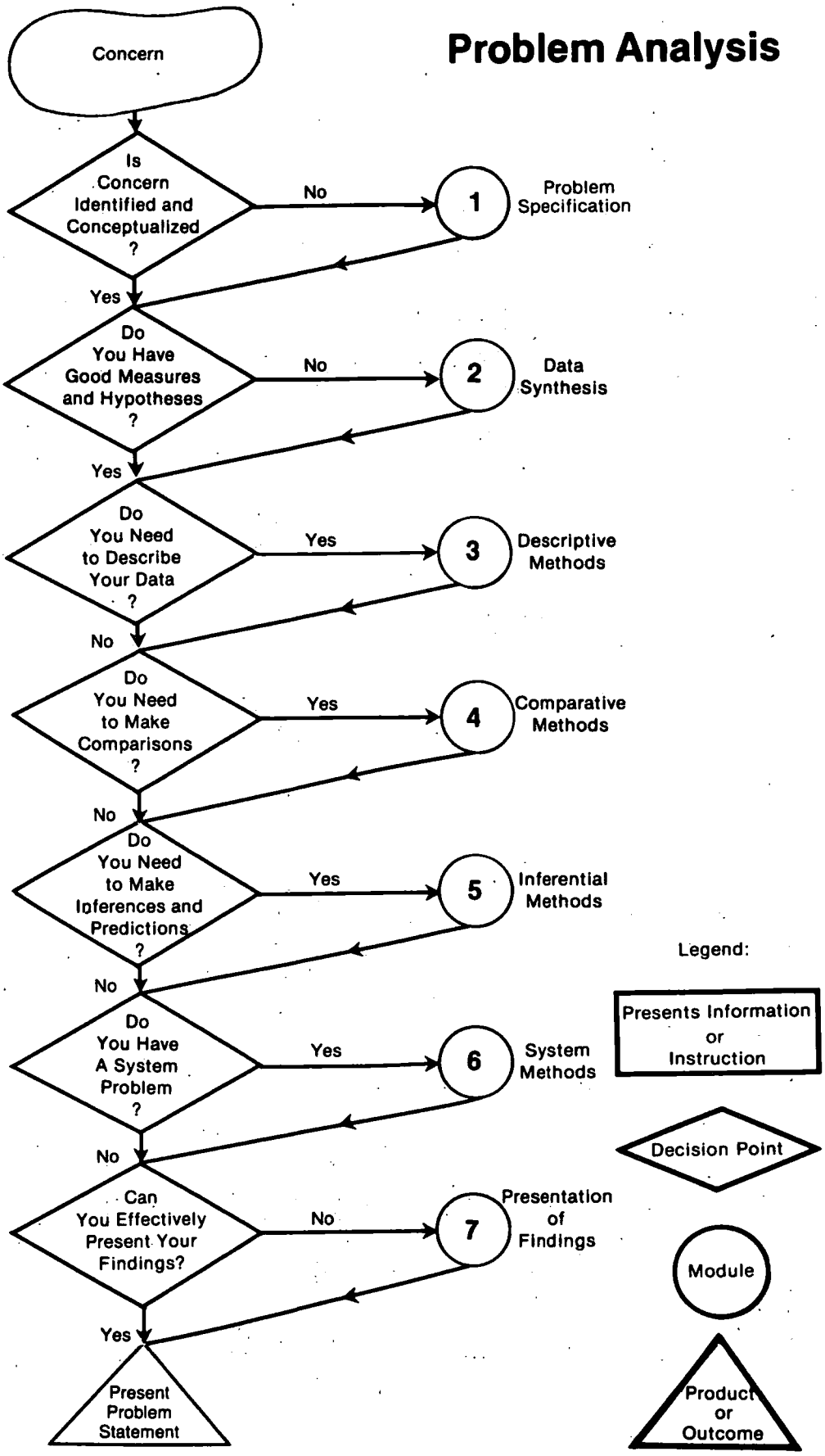


Exhibit 2

SUGGESTED

CRIMINAL JUSTICE ANALYSIS COURSE AGENDA

	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30 A.M.		Module I Problem Specification (120 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 minutes)
		Module II Data Synthesis (60 or 90 minutes)			Module VII Presentation of Findings (60 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 (150 minutes)	Module V Data Interpretation - - - Inferential Methods (continued) (100 minutes)	Major Exercise Task #3 (120 minutes)	
		Major Exercise Task #2 (120 minutes)	Major Exercise Debriefing (60 minutes)	Calculator Workshop (90 minutes)	Major Exercise Task #4 (130 minutes)	
5:00 P.M.	Orientation/ Introduction (80 minutes)					
	Managing Analysis (80 minutes)					

NOTES

d. The course is 35 hours in length and consists of: 1) Six Modules comprising 11 hours of lectures reinforced by 9 hours in 12 Walk-Throughs and 6 Exercises, 2) an optional Management Module, 3) an optional workshop and 4) a Major Exercise composed of 6 Tasks taking about 13 hours to complete.

e. In addition to the overhead format, visual aids of the module charts 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. To describe the use of specific techniques for managing analysis tasks.
2. To describe the benefits from planning an analysis effort.

MANAGING ANALYSIS

TIME ALLOCATION

TOPIC	TIME	PAGE
I. ANALYSIS PLAN	10 minutes	MA-3
A. Definition	*	MA-3
B. Need	*	MA-3
C. Developing	*	MA-3
D. Work Plan	5 minutes	MA-5
II. WORK PLAN	40 minutes	MA-6
A. Overview	5 minutes	MA-6
B. Tasking	10 minutes	MA-7
C. Labor Allocation	10 minutes	MA-18
D. Budget	10 minutes	MA-22
E. Summary	5 minutes	MA-24
III. BENEFITS OF PLANNED ANALYSIS	10 minutes	MA-25
IV. CONCLUSION	10 minutes	MA-26
A. Review	*	
	TOTAL TIME 70 minutes	

* Less than 5 minutes

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

STAGES IN DEVELOPING AN ANALYSIS PLAN	State concern for which analysis is needed	Specify concepts, variables, measures, hypotheses	Assess measures and hypotheses	Identify & select data sources	Select analysis techniques	Perform analysis	Identify audience and use for findings	Select presentation format & dissemination procedure	Determine manpower, equipment, time and funds needed
ANALYSIS PLAN COMPONENTS	Questions to be answered	Problem Specification	Prioritized list of hypotheses	Data collection plan	Selected analysis techniques	Interpretation of findings	Audience identification & use for products	Presentation and dissemination	Tasking, Labor allocation, and costing
USE (WHAT EACH STAGE TELLS THE ANALYST)	WHY	WHAT	WHAT	HOW	HOW	WHO WHAT WHEN WHERE WHY	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

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

a. Quality Control

1) This requires constant monitoring of the process and careful elaboration of <u>tasks</u> and <u>milestones</u>.

b. Staff Relations

1) Planning and implementation of who does what, when.

c. Budget Control

1) Planning and monitoring of expenditures/resources.

d. Client Relations

1) Developing usable products, responsive to your audience's needs. Module 7 will emphasize 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?

NOTES

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

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.

NOTES

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. 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. The gap during the 6 month allows for slippage.

4) 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.

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

Exhibit 2.

GANNT CHART

State Analysis of Local Crime Reduction Program Impacts by Month

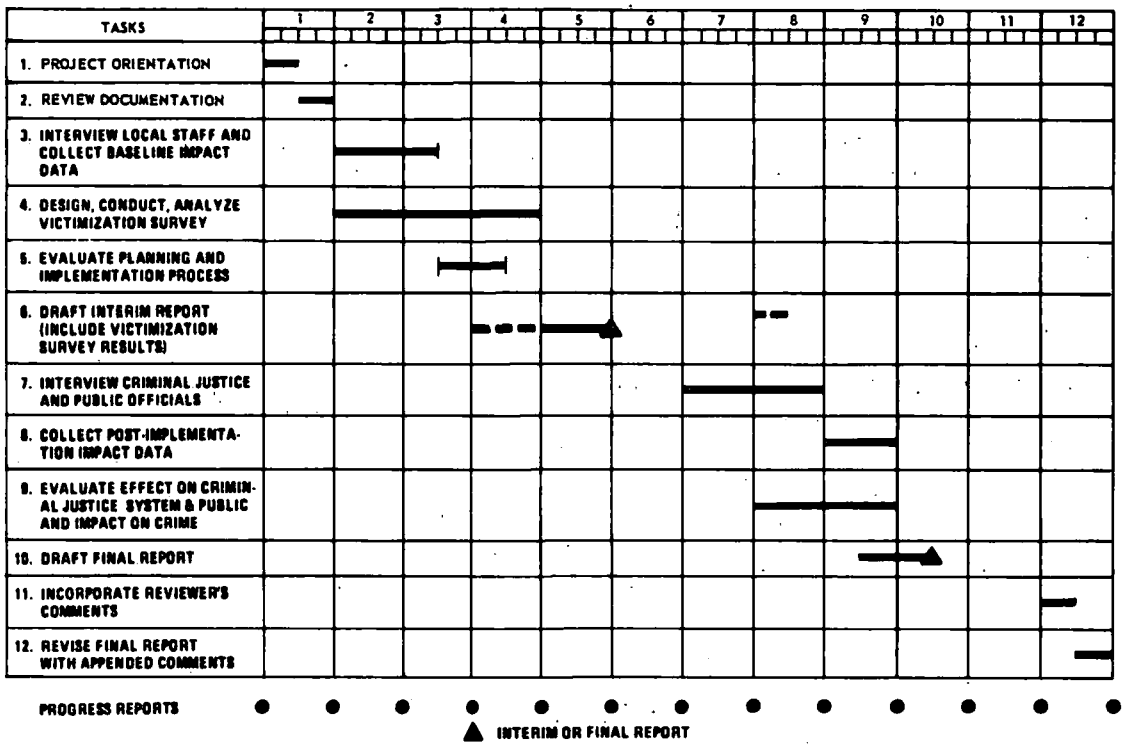
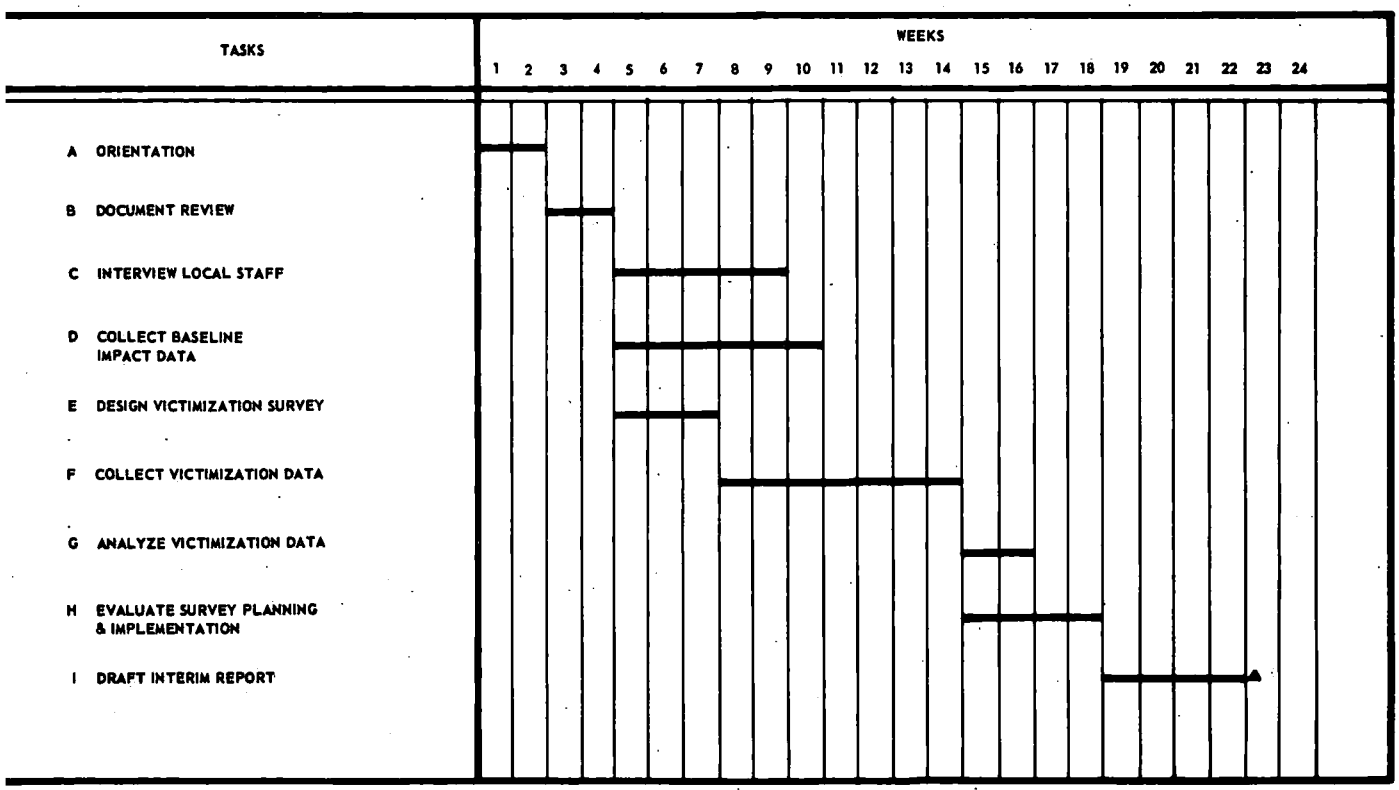


Exhibit 3.

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 2, Exhibit 4 elaborates the first six tasks (from "1. Project Orientation" to "6. Draft Interim Report") into nine activities.

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.

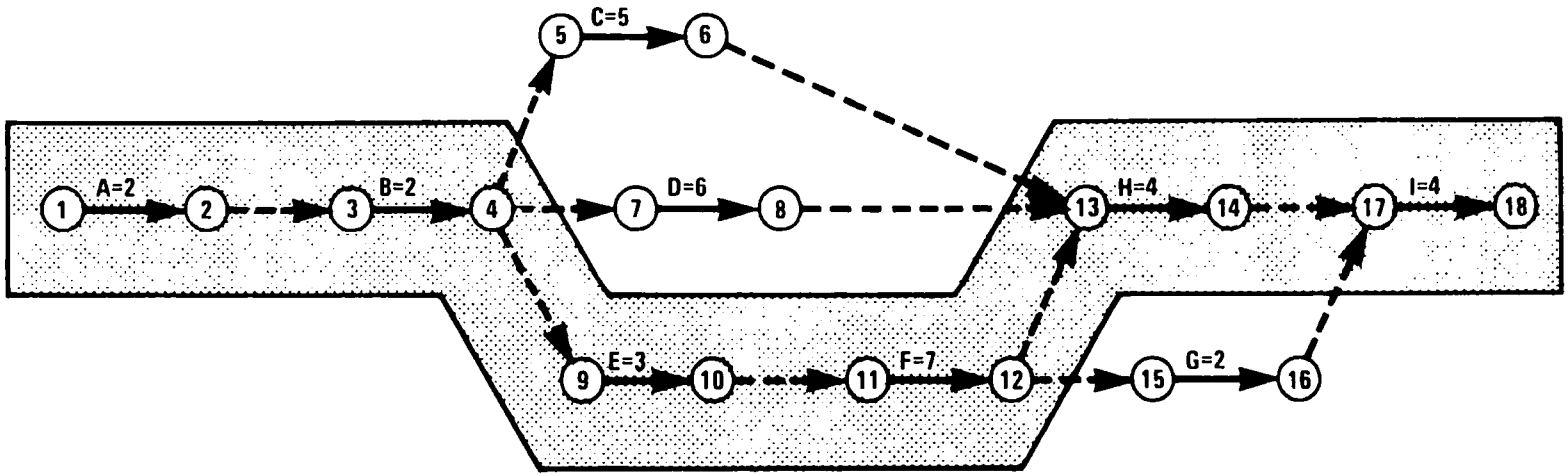
6) Note how the critical path is boxed in on Exhibit 5.

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

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.

NOTES

- 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

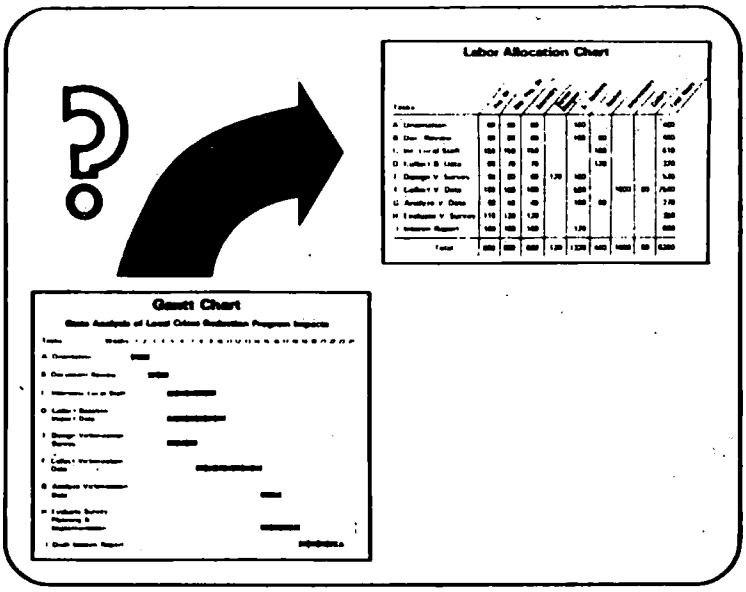
   * WEEKLY TIME LINE FOR EACH TASK
   * SIMPLE TO CONSTRUCT
   * EASY TO UNDERSTAND
   * FAILS TO SHOW INTERRELATIONSHIPS OF TASKS

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):

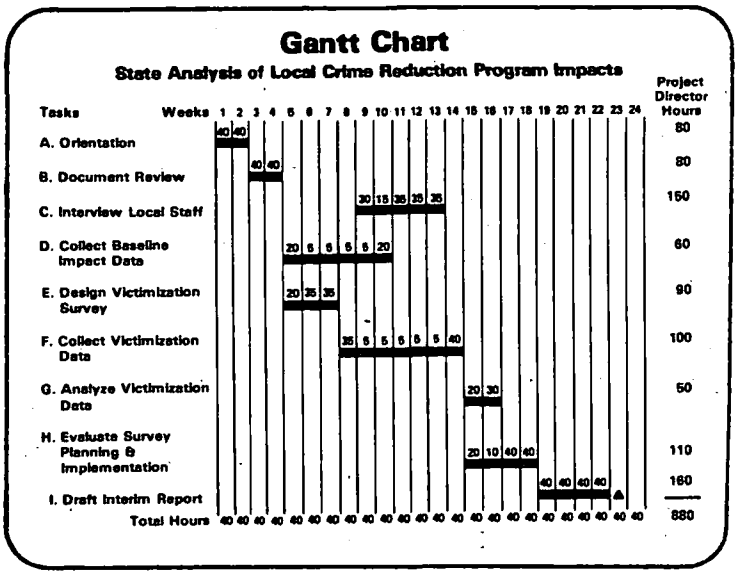
+ This V.A. illustrates how the weekly Gantt Charts may be used to develop the Labor Allocation Chart.

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.

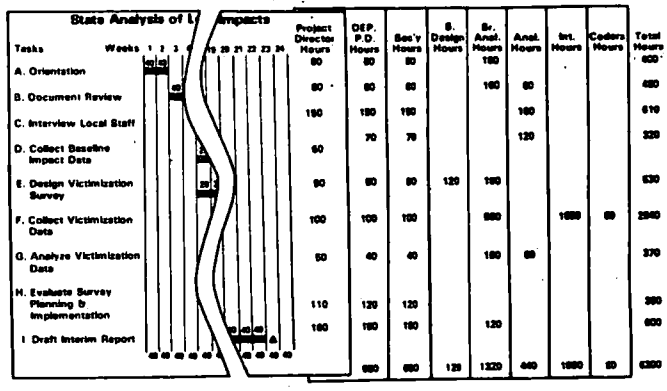
+ The summation column on the right indicates the total amount of time to be spent during the project on each task.

+ 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

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			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.

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

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.

- 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

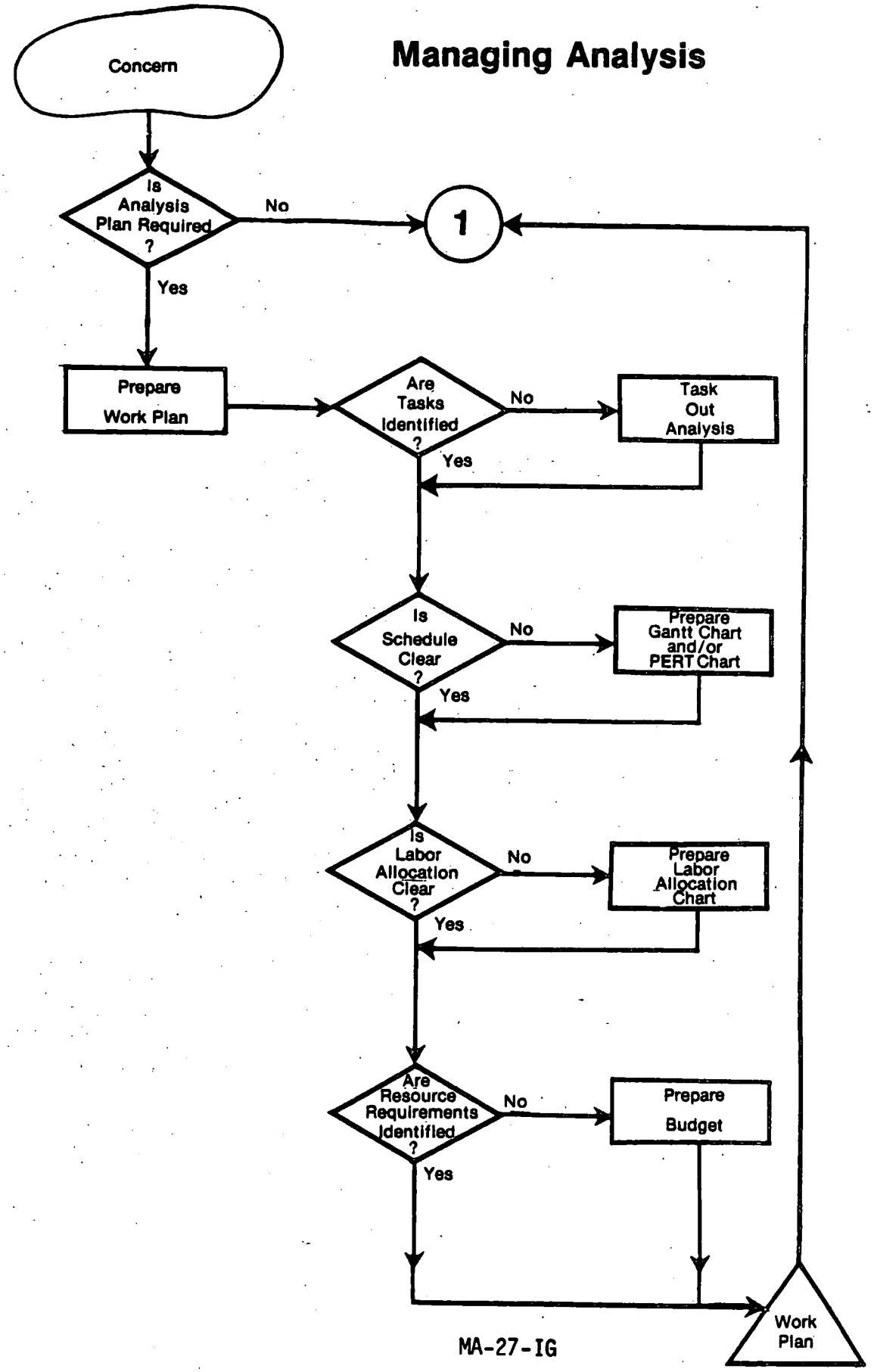
Summarize module using the module chart.

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.

SHOW V.A. (Mgt.-6):


Managing Analysis
Concern
Is Analysis Plan Required ?
No
1
Yes
Prepare Work Plan
Are Tasks Identified ?
No
Task Out Analysis
Yes
Is Schedule Clear ?
No
Prepare Gantt Chart and/or PERT Chart
Yes
Is Labor Allocation Clear ?
No
Prepare Labor Allocation Chart
Yes
Are Resource Requirements Identified ?
No
Prepare Budget
Yes
Work Plan

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 process and use of problem specification. Their ability to successfully complete the Major Exercise, hinges, in part, on their having a clear specification of their assigned problem.

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.

OBJECTIVES

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 ARE PROBLEM STATEMENTS DEVELOPED?.....	10 minutes	I-3
A. Two General Approaches..... 5 minutes		I-3
B. Problem Specification..... 5 minutes		I-5
II. HOW ARE CONCEPTS, VARIABLES AND MEASURES ELABORATED?.....	50 minutes	I-5
A. Related Concerns..... 5 minutes		I-5
B. Elaboration of Concepts.....10 minutes		I-9
C. Elaboration of Variables.....10 minutes		I-11
D. Elaboration of Measures..... 5 minutes		I-12
E. Examples		I-13
Walk-Through 'A' - TYPICAL STATEMENTS OF CONCERNS ..20 minutes		I-14
III. HOW ARE HYPOTHESES CONSTRUCTED?.....	50 minutes	I-23
A. Postulating Hypotheses..... 5 minutes		I-23
B. Examples of Hypotheses in a Problem Statement..... *		I-27
Walk-Through 'B' - HYPOTHESES IN A WRITTEN PROBLEM STATEMENT ..45minutes		I-28
IV. RELATIONSHIP OF PROBLEM SPECIFICATION.....	5 minutes	I-57
A. The Differences..... *		I-57
B. Importance..... *		I-57
C. Meaning..... *		I-58
D. Definition..... *		I-58
V. CONCLUSION.....	5 minutes	I-58
TOTAL TIME	120 minutes.	

* Less than 5 minutes.

NOTES

I. HOW ARE PROBLEM STATEMENTS DEVELOPED?

A. Two general approaches:

1. Inductive - frequently problem statements are "data-driven." Specific components of information provide compelling evidence that a problem exists. In these cases the analyst moves from the specific to the general using what is called inductive reasoning.

a. This methodology is frequently used in situations where the data-base is well developed. For example, a crime analyst reviewing Uniform Crime Report data can usually develop a fairly complete problem statement. Deviations from the norm, aberrations or other significant factors literally cause these exceptional data elements to stand out from the rest of the data set and enable the analyst to describe the problem and draw conclusions.

b. Participants who have participated in the Planning Course will recognize that the Gotham City Exercise enabled this approach and the course taught several techniques to help the analyst detect the deviations, aberrations and other significant factors

2. Deductive - In those cases where the existing data-base is insufficient to the needs of the analyst or in those instances where the analysis is driven by community issues, questions and concerns, the analyst moves from the general to the specific, using deductive reasoning, to describe the problem and reach conclusions.

a. This type of analysis is frequently used in situations where concerns are raised by the community, the press, elected officials and agency officials. The evidence to support, modify or reject these contentions must be developed by the analyst using the existing data or generating new data. This procedure results in new information that may be used in the development of a problem statement.

b. Despite the fact that the criminal justice community has significantly expanded the "data-base" at all levels in recent years, the "issues" and concerns being addressed by the criminal justice profession, require the analyst to continue to examine the existing data-base in different ways and selectively expand the data-base to meet special information needs.

   As the data-base expands, it becomes more difficult to inductively analyze to identify exceptions and differences.

   Because expanding the data-base may be expensive, the new data elements need to be carefully selected.

c. This course teaches a deductive approach to problem analysis. Many different procedures have been reviewed and the best elements of several procedures have been selected and intergrated into this course.

B. Problem Specification:

1. Definition: In this course Problem Specification is defined as the identification of concerns; elaboration of concepts, variables, and measures; and postulation of hypotheses. Problem specification consists of:

   a. the identification of concerns;

   b. the elaboration of concepts, variables and measures; and

   c. postulating hypotheses.

II. HOW ARE CONCEPTS, VARIABLES and MEASURES ELABORATED?

A. Identification of Related 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.

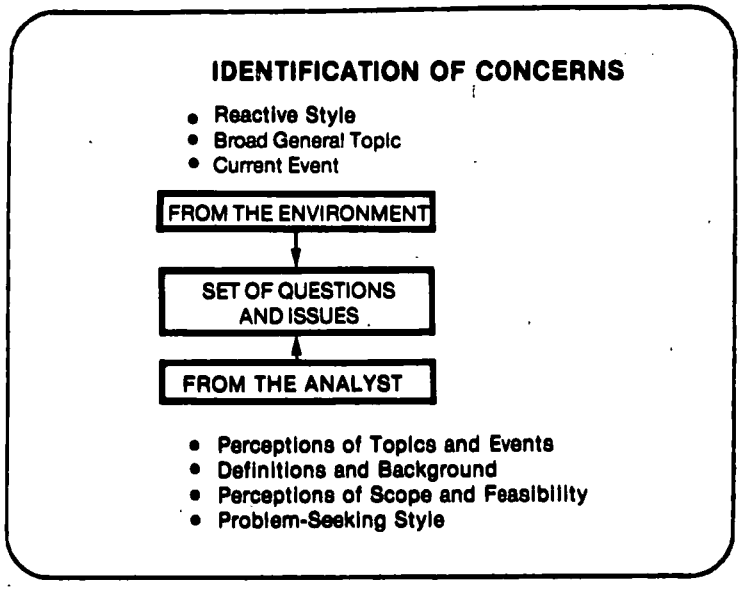
2. Typically concerns are not well articulated and are usually reactions to symptoms -- not causes.

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.

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.

+ Examples of the genesis of concerns could be used to illustrate these points:

  - one emanating from the environment

  - one emanating from the analyst

  - one that emanates from the environment and the analyst concurrently and for different reasons.

+ These concerns should trigger a deductive search for evidence.

4. There are interactions and interdependencies among concerns.

   a. Many stated concerns 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.

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

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

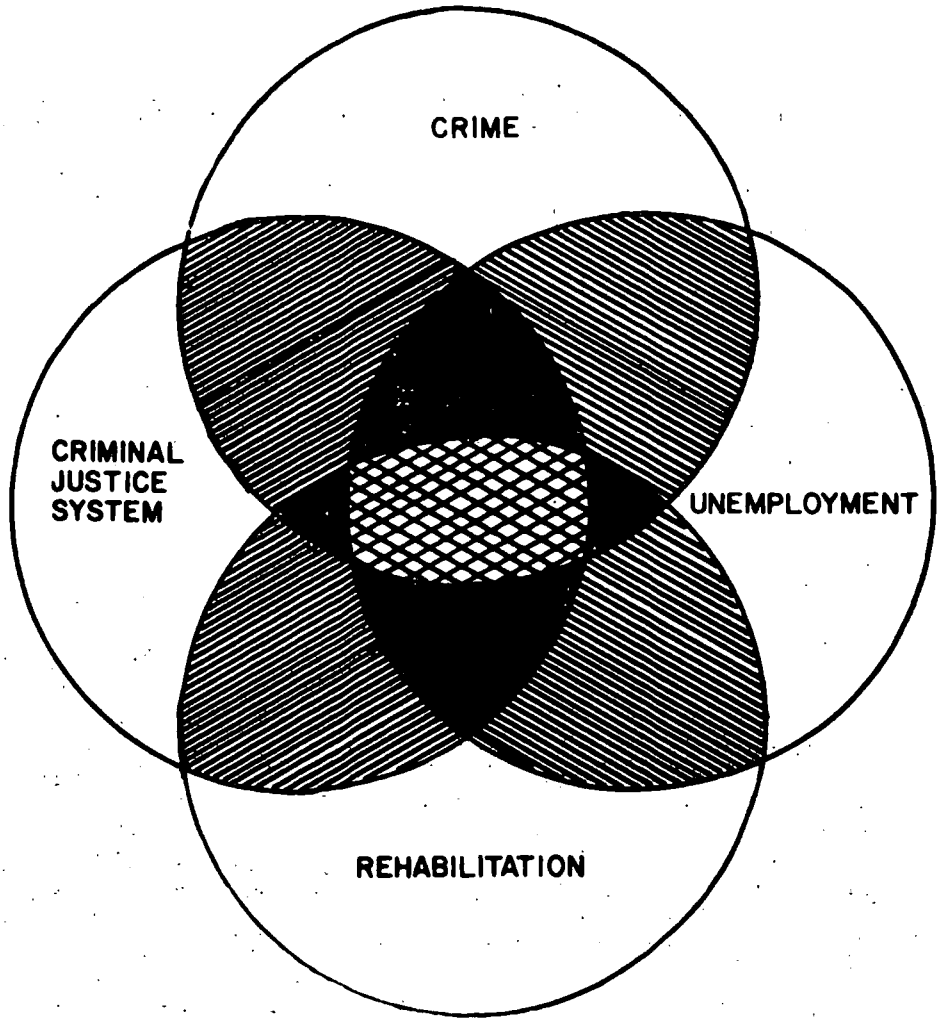
      Refer to Exhibit 1.

      Note in Exhibit 1 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 of the Criminal Justice System affect crime and that crime affects criminal justice programming. Furthermore, we see that rehabilitation of offenders impacts both the Criminal Justice System and crime. Together rehabilitation, crime, unemployment and the Criminal Justice System may all be interrelated in some respects.

   d. Thus, before focusing on the problem specification and proceeding, the analyst should consider related concerns, which may not have been expressed, and include those determined relevant.

Exhibit 1

INTERACTION & INTERRELATIONS AMONG CONCERNS



B. 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. Subjecting vague and multiple concerns to analysis frequently results in the production of masses of data which have little analytic utility and produce little useful information.

5. For analytic purposes, it is generally useful to sort out areas of concern so that the questions and concepts inherent in each area may be determined and specified.

   a. Environment: The criminal justice system exists and operates within a context of many external factors composing its environment.

      Some of these factors are:

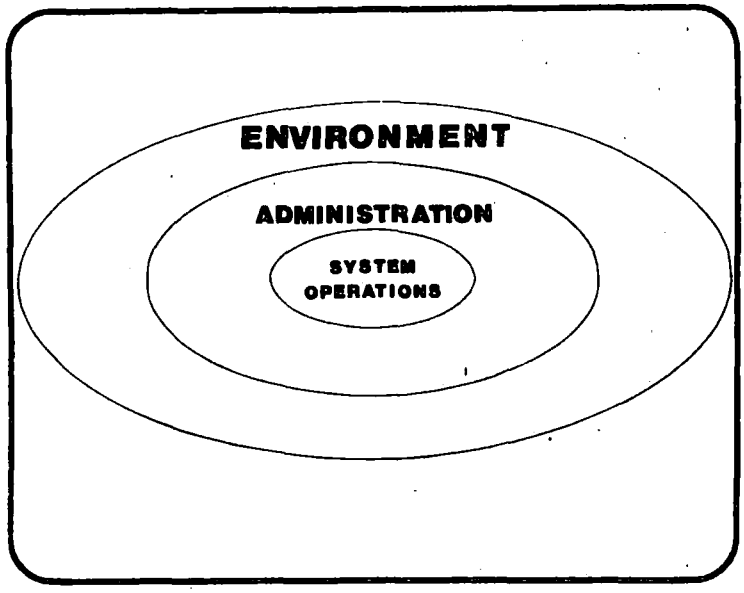
      geography
      current events
      public attitudes
      politics
      commission of crime

   b. Administration: There are administratively determined factors related to the structure and function of the criminal justice system which serve as a buffer between the environment and the operations of the system.

Some examples include:

legislation
policy
organization
standards
goals

SHOW V.A. (1-2)



---

c. System Operations: System Operations encompasses the activities performed by the units of the criminal justice system. These activities occur within the context of and interact with the Environment and Administration.

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

C. Elaboration of Variables

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

2. Elaborating concepts into variables forces the analyst to clarify exactly what is meant by the concept being studied.

3. Because a concept may usually be expressed through many variables, the choice of the most appropriate variables will be a difficult but important choice.

   a. The variables contained in reported crime often include the type of crime committed, the characteristics of the victim, the area of the city in which the crime was committed and other related variables.

   b. Recidivism might be expressed as rearrests, reconvictions or reincarcerations.

   c. In the context of system operations, variables will usually be expressed as input, performance, output and other factors related to the operation of the criminal justice system.

Instructor Note: System analysis will be covered in detail in Module 6. However, if participants need definitions for these terms now, quickly provide the following general definitions:

Input is those resources, work to be processed, and other factors which enable the system to function.

Performance is how the work is accomplished by the system, e.g. how well, how quickly, etc.

Output is what is actually accomplished by the system, e.g. accidents investigated, cases tried, persons paroled, etc.

4. There may be several ways to measure a given variable.

D. 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 difficult to measure such as citizen perception about street safety after dark.

3. Measures used to describe the occurance of crime range vary from simple frequency counts to complex index numbers, such as, population-at-risk measures for specific crimes.

4. Similarly, in system operations, measures can be simple frequency counts of workload or more complex measures of system performance, such as efficiency, effectiveness or productivity.

Instructor Note: Module 2 covers the topics of measurement accuracy. Module 4 covers indices. Module 6 covers performance measures. The Glossary provides definitions for most of the terminology used in the course. While participants will not need to know the details until Module 6, you may wish to briefly define these terms:

Efficiency measures how much of the work to be done is done.

Effectiveness measures how the result compares to what is expected.

Productivity measures the results accomplished with the resources used.

NOTES

E. Examples of the Elaboration of Concepts, Variables and Measures.

1. Walk-Through A provides examples of the elaboration of concepts, variables and measures from typical statements of concern.

Typical Statements of Concerns about Crime and the Criminal Justice System

WALK-THROUGH 'A'

PURPOSE

The purpose of this Walk-Through is to illustrate how to elaborate concepts, variables and measures from 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 and measures.

INSTRUCTOR NOTES

A. Maximum time available for this Walk-Through is 20 minutes. Depending upon how the participants grasp the elaboration of concepts, variables and measures, review 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 concepts, variables, and measures. After the participants have given their input, go through the Example 1 Worksheet systematically indicating all these items, call particular attention to those not mentioned by the participants. The worksheets reflect both explicit and implicit concepts, variables and measures. Implicit entries have been made parenthetically. Other concepts not presented on the worksheets may be addressed; however, only those concepts included explicitly in the narrative content appear in the worksheets.

D. The Instructor should not focus on errors within the concern statements, e.g., the confusing definition of variables and measures that are presented. The purpose of this walk-through is to correctly specify concerns, concepts, variables, and measures which would facilitate analyses of the problems.

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 allow discussion of other relevant concepts which might be considered in analyzing the concern.

2. Example 3 is a typical statement which contains virtually no numerical data. Examples like this often arise as a result of citizen initiatives or public outcry.

DEBRIEFING NOTES

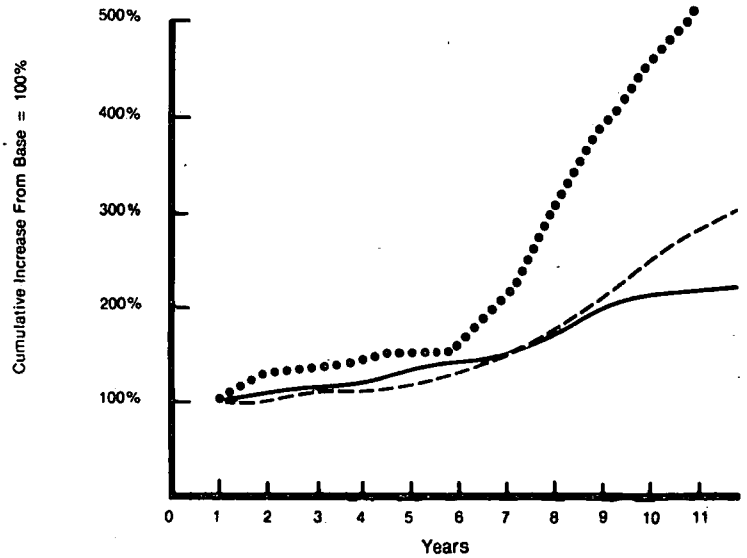
A. The elaboration has shown that omissions sometimes exist in concern statements. Concepts, variables, or measures may not be explicitly stated. The elaboration of these considerations helps to understand the problem better and to understand the logical linkages between concepts, variables, and measures.

DATA SET/WORKSHEET

Example of a Concern Statement

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 (nominal level) 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 Concept
Analysis of recent trend data, however, indicates that the city's assault rate has shown dramatic increases over the last several years.	Measure (nominal level)
These increases substantially out-distance the proportional increase in robberies and indicate that unless preventive action is taken assaults may become a significant problem.	Concept
This trend is exacerbated by recent signs that the homicide rate is now increasing as a result of the increase in assaults. 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. 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



Year One = 100%
Source: Chaos City Police Department, Annual Report, 1977

WALK-THROUGH 'A'

WORKSHEET
WALK-THROUGH A, EXAMPLE 1
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: Crime Trends in Chaos City

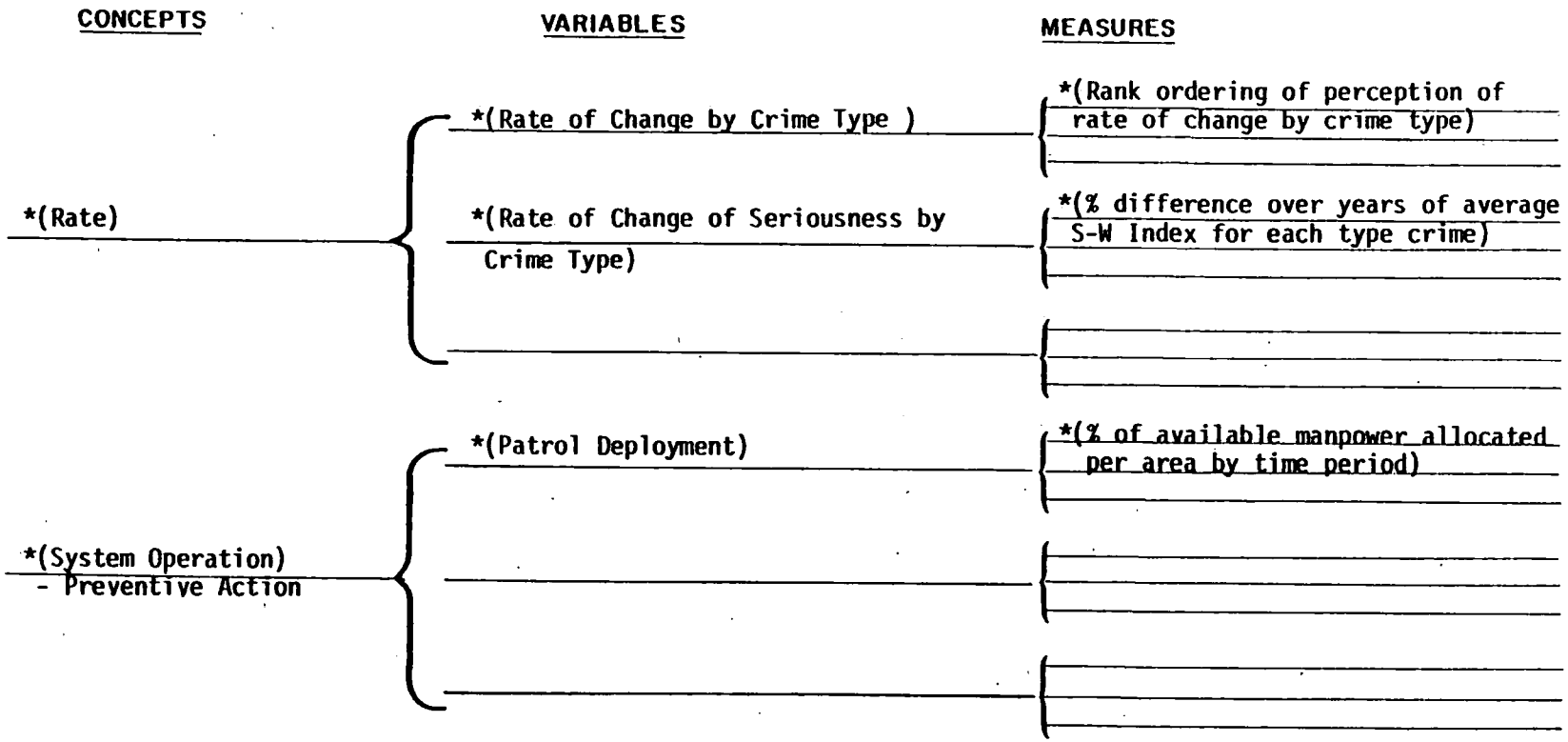
CONCEPTS	VARIABLES	MEASURES
Magnitude	Frequency of Occurrence by Crime Type	Cumulative increase by crime type per year # Crimes by type
	*(Risk of Crime by Crime Type)	*(# of crimes by type per population at risk)
	*(Reporting Rate by Crime Type)	*(% of persons in victimization survey reporting each type crime)
Seriousness	Perceptions of Seriousness	*(Rank ordering of perception of seriousness)
	*(Harm to Community by Crime Type)	*(Average seriousness score on S-W Scale for harm from each type of crime)

*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

WORKSHEET
WALK-THROUGH A, EXAMPLE 1 (CONTINUED)
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: Crime Trends in Chaos City (Continued)



*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

B. Example 2

District Court Processing of Felony Cases — Concern

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.

Variables

Variables

Measures

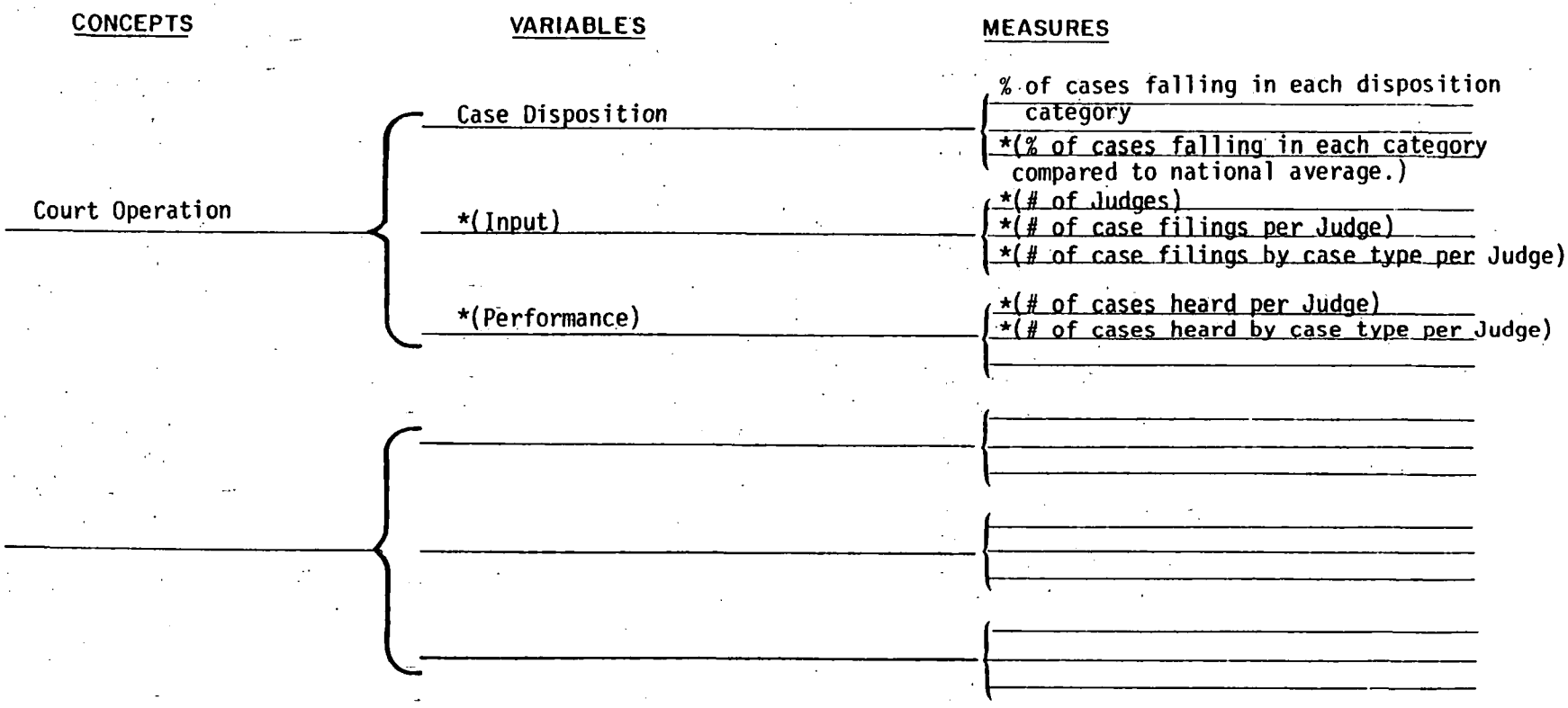
Variable Measures

Measures

WALK-THROUGH 'A'

WORKSHEET
WALK-THROUGH A, EXAMPLE 2
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: District Court Processing of Felony Cases in Chaos City



*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

C. Example 3

Rape in Chaos City

Concern

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.

Concept
Measure (nominal level)

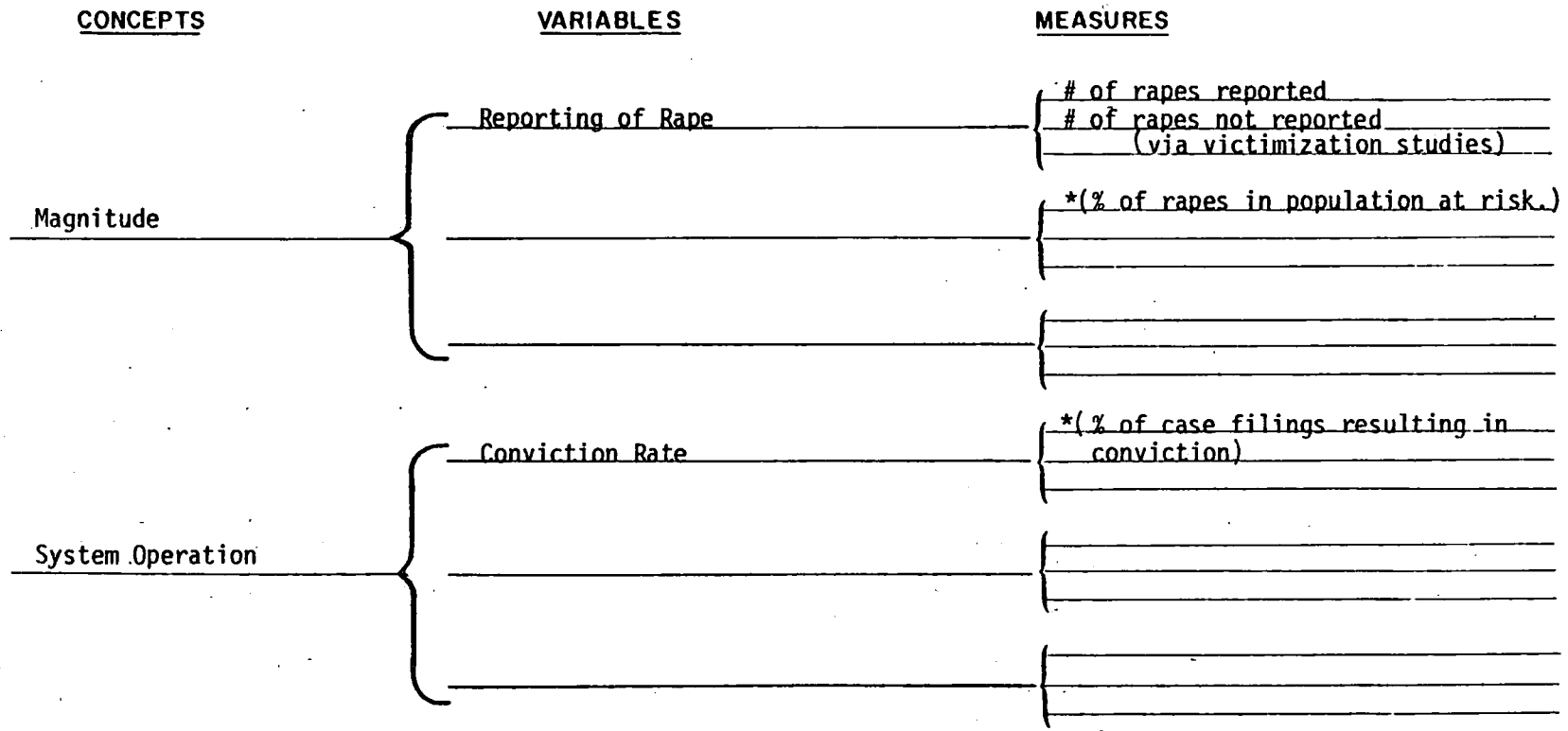
Variable

Measure (nominal level)

WALK-THROUGH 'A'

WORKSHEET
WALK-THROUGH A, EXAMPLE 3
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN: Rape in Chaos City



*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

NOTES

III. HOW ARE HYPOTHESES CONSTRUCTED?

A. 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 experience, intuition, theory and logic to construct hypotheses.

3. It may be helpful to think of hypotheses as statements which describe the relationship between two factors (which may be concepts, variables or measures). A list of phrases which are frequently used include:

   is related to
   is unrelated to

   is greater than
   is less than

   is increased by
   is decreased by

   is equal to
   is unequal to

4. Hypotheses are important because they help to establish boundaries of a problem, focus the analytic effort and may suggest potential problem-solving strategies.

5. Some hypotheses are descriptive in nature, and principally deal with assertions of relationships.

   Descriptive hypotheses are most typical of the kind usually dealt with in criminal justice. They usually involve considerations of logical or temporal sequence, but do not involve issues of "cause" and "effect".

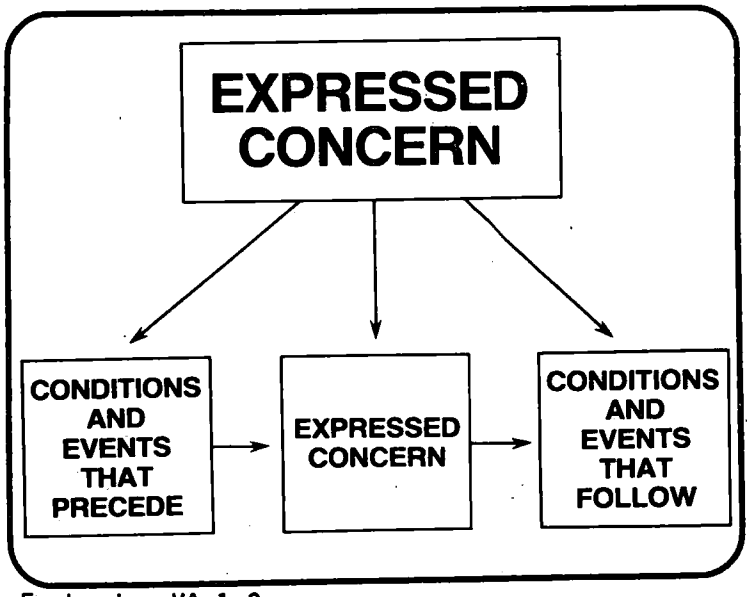
When in a descriptive hypothesis, a relationship is asserted between "dependent" and independent" factors, these factors are determined as follows:

- Independent: that factor which logically or temporally precedes the dependent factor and which is being used to explain or understand something about the dependent factor.

- Dependent: That factor which logically or temporally follows the independent factor and which is under study.

The identification of independent and dependent factors requires the analyst to logically describe the problem (e.g., relate conditions and events that precede and follow the expressed concern and then organize these conditions and events into logical sequence) and use this description to select independent and dependent factors.

SHOW V.A. (1-3):



Emphasize VA 1-3

+ The instructor should use a simple example to illustrate this procedure.

---

6. Other hypotheses imply a "cause" and "effect" relationship. In this course they will be called causal hypotheses.

   Causal hypotheses are inherently complex and risky. It is very difficult to establish an accurate causal relationship in criminal justice problems because of the many factors which effect each concern, condition, or event.

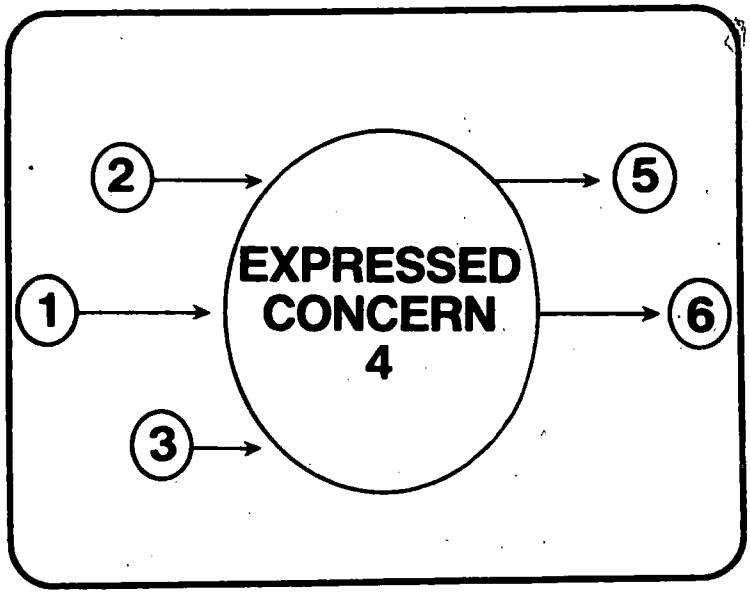
   In a causal hypotheses, a cause and effect relationship is asserted between dependent and independent factors:

   - Dependent: A characteristic or event which is hypothesized to change as a result of another occurance or change in another characteristic, trait or event.

   - Independent: A characteristic, trait or event which is presumed to affect or influence changes in another characteristic, trait or event.

The selection of causal hypotheses may be guided by organizing events and conditions into three categories: "presumed causes", "primary effects" and "secondary effects." A network or these conditions and events can be contructed to determine these categories.

SHOW V.A. (1-4):



Emphasize VA 1-4

+ Numbers 1, 2 and 3 are presumed causes.

+ Number 4 is the primary effect.

+ Numbers 5 and 6 are secondary effects.

+ Note: In the network illustrated the expressed concern is the primary effect. This is not always the case. The expressed concern may be a secondary effect or a presumed cause of the problem rather than the primary effect.

These categories are defined as follows:

- Presumed Causes: Those conditions and events that are thought to come before and lead to the expressed concern and related events and effects.

- Primary Effects: Those events and conditions that directly result from the presumed causes.

- Secondary Effects: Those events and conditions that directly result from the primary effects and indirectly result from the presumed causes.

Once these events and conditions have been grouped in categories, then causal hypotheses can be postulated using the following rules:

- In hypotheses that relate presumed causes to primary and secondary effects, the presumed cause is the independent factor.

- In hypotheses that relate primary effects to secondary effects, the primary effect is the independent factor.

Be careful! Avoid spurious relationships: relationships that are illogical or apparent relationships between two factors where the apparent relationship is the result of a third factor.

---

7. The investigation of cause and effect relationships is critical to the analysis process. The statistical tools presented in this course, by themselves, are insufficient.

   The investigation of causality rarely involves a simple test of a single hypothesis. The analyst must draw on experience, intuition, theory and logic as well as on analytic tools, such as the statistics taught in this course.

B. Examples of Hypotheses in a Problem Statement.

   Walk-Through B presents an example of a Written Problem Statement which illustrates the use of hypotheses.

Hypotheses in a Written Problem Statement

WALK-THROUGH 'B'

PURPOSE

The purpose of this Walk-Through is to reinforce the elaboration of concepts, variables, and measures and to provide experience in the postulation of hypotheses. The data set for the exercise also provides a concrete example of a Written Problem Statement. The Walk-Through Worksheets also serve as an illustration of two of the products required by the Major Exercise to elaborate concepts, variables, and measures (Worksheet A) and to postulate hypotheses (Worksheet B).

Using the Problem Statement and the completed elaboration worksheets, the instructor will provide an example of the postulation of hypotheses for one of the findings (paragraph 3.1) using a completed Part B Worksheet. Then in class discussion the instructor will lead the class through the postulation of hypotheses for two additional findings.

INSTRUCTOR NOTES

A. Participant Guides contain the written Problem Statement, completed worksheets for Part A (Elaboration Concepts, Variables and Measures) for all sub-sections of Section 3 of the Problem Statement and a completed Part B Worksheet for sub-section 3.1. Completed Part B Worksheets for the remaining sub-sections should be ready to hand out to participants at the completion of the Walk-Through.

Note: Each Participant Guide contains the handouts. These are placed after the Glossary at the end of the book. These pages should be removed before distributing the Participant Guide to the participants. The pages that are removed will serve as hand-outs.

B. The instructor should check to see how many participants have read the Problem Statement provided in the Data Set prior to class participation. (Note: It is suggested that the Problem Statement be provided to participants with pre-course materials and that they be asked to review the Problem Statement prior to course participation.)

C. Prior to the Walk-Through the Instructor should select two additional sub-sections with section 3 of the Problem Statement (e.g. 3.2 and 3.5) to be used in class.

D. Ask all participants to read the Introduction to the Problem Statement (about 3 minutes).

E. Direct the participants to sub-section 3.1 and give them five minutes to review the sub-section and the related Part A Worksheet. (The Worksheets have been keyed to the related sub-sections.) After they have completed this review, lead them through the hypotheses indicated in the Part B Worksheet, emphasizing the differences between hypotheses constructed at the conceptual, variable and measurement levels and the relationships among these hypotheses.

F. Next ask the Participants to review the sub-section and the related Part A Worksheets for the first sub-section you have selected. Ask them to identify hypotheses during this review.

Then using flip charts lead the group through the development of appropriate hypothetical statements. Develop a degree of rigor during this discussion, making distinctions between conceptual, variable, and measurement level hypotheses.

G. Repeat this process for the final sub-section you selected.

H. Time Schedule:

1.	Instructions and Read Introduction	- 5 minutes
2.	Review and illustrate first sub-section	- 15 minutes
3.	Review and discuss two additional sub-sections	- 20 minutes
4.	Debriefing	- 5 minutes
		45 minutes

DEBRIEFING

A. Hand out the completed Part B Worksheets for all sub-sections.

B Debrief the Walk-Through and emphasize the following:

- How measurement level hypotheses are used for the analysis but that conceptual level hypotheses are frequently used to communicate with decision makers.

- The need for logical linkages in the development of hypothesis is critical.

- That two types of hypotheses have been used: descriptive and causal.

- That the construction of hypotheses in the Major Exercise, as in the real world, requires creativity. Theory and practice establishes a basis for hypotheses construction. Other clues to hypotheses construction may come from the provided data set. This process of construction is not rigidly structured by may be an interaction of deductive and inductive thinking.

WALK-THROUGH 'B'

DATA SET

PROBLEM STATEMENT: VEHICLE THEFT IN CHAOS CITY, 1977

TABLE OF CONTENTS

1.0 Introduction.....I-31

1.1 Statement of Concerns.....I-31
1.2 Nature and Source of Concerns.....I-31
1.3 Scope of Concerns.....I-31

2.0 Analysis Methodology.....I-31

2.1 Definition of Terms Used.....I-31
2.2 Measurement Reliability and Validity.....I-32
2.3 Data Collection Procedures.....I-32
2.4 Statistical Methods.....I-32

3.0 Findings.....I-33

3.1 Magnitude of Motor Vehicle Theft is Similar in Comparable Cities.....I-33
3.2 Chaos City System Response is Different than National and State Level System Response.....I-33
3.3 Auto Theft in Chaos City is a Less Serious Crime.....I-34
3.4 Auto Theft Varies by Area and Location.....I-35
3.5 Auto Thefts are Deterred by Reducing Opportunities to Steal.....I-38
3.6 Characteristics of Motor Vehicle Theft Vary by Type of Vehicle.....I-41
3.7 Most Suspects of Auto Theft are Amateur Thieves.....I-41
3.8 Those Arrested for Auto Thefts are Generally Young.....I-41

4.0 Discussion.....I-42

4.1 Findings Relative to Expressed Concerns.....I-42
4.2 Limitations.....I-42

5.0 Summary.....I-43

5.1 Highlights.....I-43
5.2 Conclusions.....I-44

DATA SET (continued)

Problem Statement: Vehicle Theft in Chaos City, 1977.

1.0 Introduction

1.1 Statement of Concerns

Recently, vehicle theft has become the focus of complaints by leading downtown businessmen. The downtown area has been staging a difficult economic comeback the last few years and the businessmen feel that vehicle thefts have increased to a point that shoppers will curtail downtown trade.

1.2 Nature and Source of Concerns

The origin of the businessmen's complaint does not appear to be founded on survey or other data forms that would identify shopper's preference for shopping location. The major thrust of the businessmen's concern seems to be based on their perceptions and possibly reinforced by complaints from customers.

1.3 Scope of Concerns

The problem perceived by the businessmen has been communicated to both the business community and the public. Quite possibly their complaint coupled with news publicity could actually affect shopping location preference. Thus, their fear in itself could become a detrement to downtown trade.

At the request of the Mayor, an analysis of motor vehicle theft has been conducted and is reported in this document.

2.0 Analysis Methodology

2.1 Definition of the Terms Used

According to State of Paradise Statute 609.55 (1971), vehicle 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 apporpriate, distinctions are made between theft of automobiles, trucks, motorcycles and other motorized vehicles. Since the bulk of the vehicle theft is associated with private automobiles, the greater portion of this problem statement is concerned with analysis of automobile thefts.

WALK-THROUGH 'B'

2.2 Measurement Reliability and Validity

Previous victimization surveys have shown that over ninety percent of stolen autos are reported to the police. A primary motivation for this is the need to collect insurance on these stolen vehicles. Thus the figures should be fairly reliable as well as valid. The reporting rates may, however, vary by section of the city as persons without insurance have less incentive to report stolen autos.

The measure of risk, number of cars stolen divided by 1,000 registered vehicles, suffers from the lack of an accurate count of registrations by section of the city. The problem is particularly acute downtown as the number of cars parked downtown greatly exceeds the number registered in that area. In these instances the analysis relies upon measures of frequency to corraborate the risk measure.

2.3 Data Collection Procedures

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. These sampled offense reports are 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.

2.4 Statistical Methods

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.

The mathematical tools employed in this analysis were: ranking, comparative tables, and chi square.

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

WALK-THROUGH 'B'

3.0 Findings

3.1 Magnitude of Motor Vehicle Theft is Similar in Comparable Cities

According to the general impression of the police department, the problem of motor vehicle theft in Chaos City is no larger than that experienced in other cities of similar size across the country. The number recorded by the Department during the study period was 5,085. This figure was found to be about 500 less than the average number motor vehicle thefts for similar size cities.

The 5,085 motor vehicle thefts were distributed as follows:

Automobiles	4,450
Trucks	255
Motorcycles	335
Other motorized vehicles	45

For automobiles the victimization rate (calculated on basis of registered autos) was about 30.9 per 1,000 or roughly 1 in 32. Victimization surveys indicate that approximately 93 percent of all vehicle thefts are reported to police. Correcting for non-reported thefts revises the total of motor vehicle thefts to about 5,470.[1]

3.2 Chaos City System Response is Different than National and State Level System Response

Based on national clearance rates and the clearance rates of other property crimes in Chaos City such as burglary, we anticipated that the clearance rate for vehicle theft would be the same as other vehicle theft and the same as the national clearance rate. Clearance rate is defined here as those cases which are cleared by arrest.

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 vehicle 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 vehicle theft. There is no information on rate of conviction or sentencing patterns.

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[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.

WALK-THROUGH 'B'

3.3 Auto Theft in Chaos City is a less Serious Crime Problem

Auto theft was expected to be a less serious problem for Chaos City than other property crimes. Two measures of seriousness were available for this analysis. In addition, 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 the dollar figures for auto theft reflects the fact that most automobiles (90.8 percent) taken from Chaos City are recovered--only 8.5 percent of all thefts are not recovered. The balance of reported thefts (70 percent) are classified as unfounded. For example, the car was not stolen, merely misplaced. Thus, the net dollar loss of $1,175,087 for motor vehicles is less serious than the value of $3,045,624 for unrecovered resident burgulary property. Further, 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 vehicle theft incurs costs other than those associated with the value of the vehicle. Private vehicles 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 vehicle thefts and the intangible cost of increased concern about crime.

There is also no information available as to the cost to the criminal justice system to investigate and prosecute cases of vehicle theft. Likewise, statistics were unavailable to compare the seriousness of auto theft downtown with other crimes occuring downtown.

WALK-THROUGH 'B'

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[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.

3.4 Auto Theft Varies by Area and Location

The hypotheses which guided this analysis are:

The magnitude of auto theft varies by geographic area of the city.

The magnitude of auto theft varies by type of parking environment.

As hypothesized, the data show that 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, which supports the hypothesis.

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

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	-	4,970	-
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

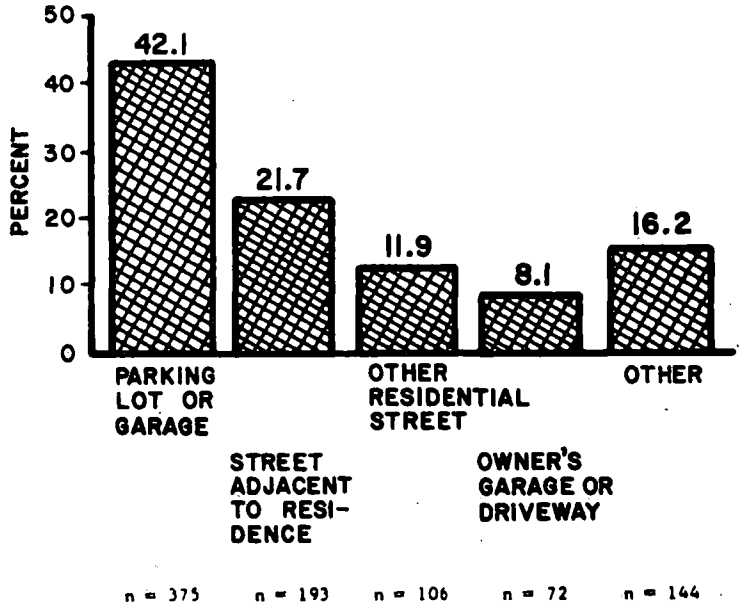
*Each registered passenger vehicle is counted as an opportunity. Each community has a sufficiently large number of vehicles to make meaningful comparisons: Calhoun-Isles, 14,995; Camden, 13,338; Central, 6,525; Longfellow, 13,080; Near North, 14,334; Nokomis, 19,907; Northeast, 16,853; Powderhorn, 28,411; 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.

The number of auto thefts in each community was based on a 20% city-wide sample. The sample frequencies in the communities had to be multiplied by 5 to estimate the number stolen.

WALK-THROUGH 'B'

As shown in Figure 1, 42 percent of all automobiles are taken from parking lots or garages while only one-third are taken from near the owner's residence or nearby residential streets. Less than 1 in 10 automobiles are taken from the owner's garage or driveway.

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

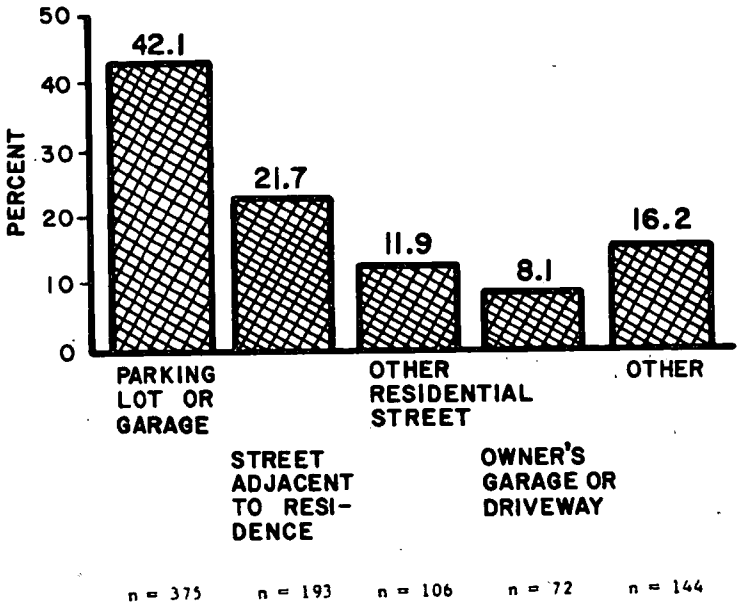


Source: Chaos City Police Offense Report Data. (N = 890). 1977.

WALK-THROUGH 'B'

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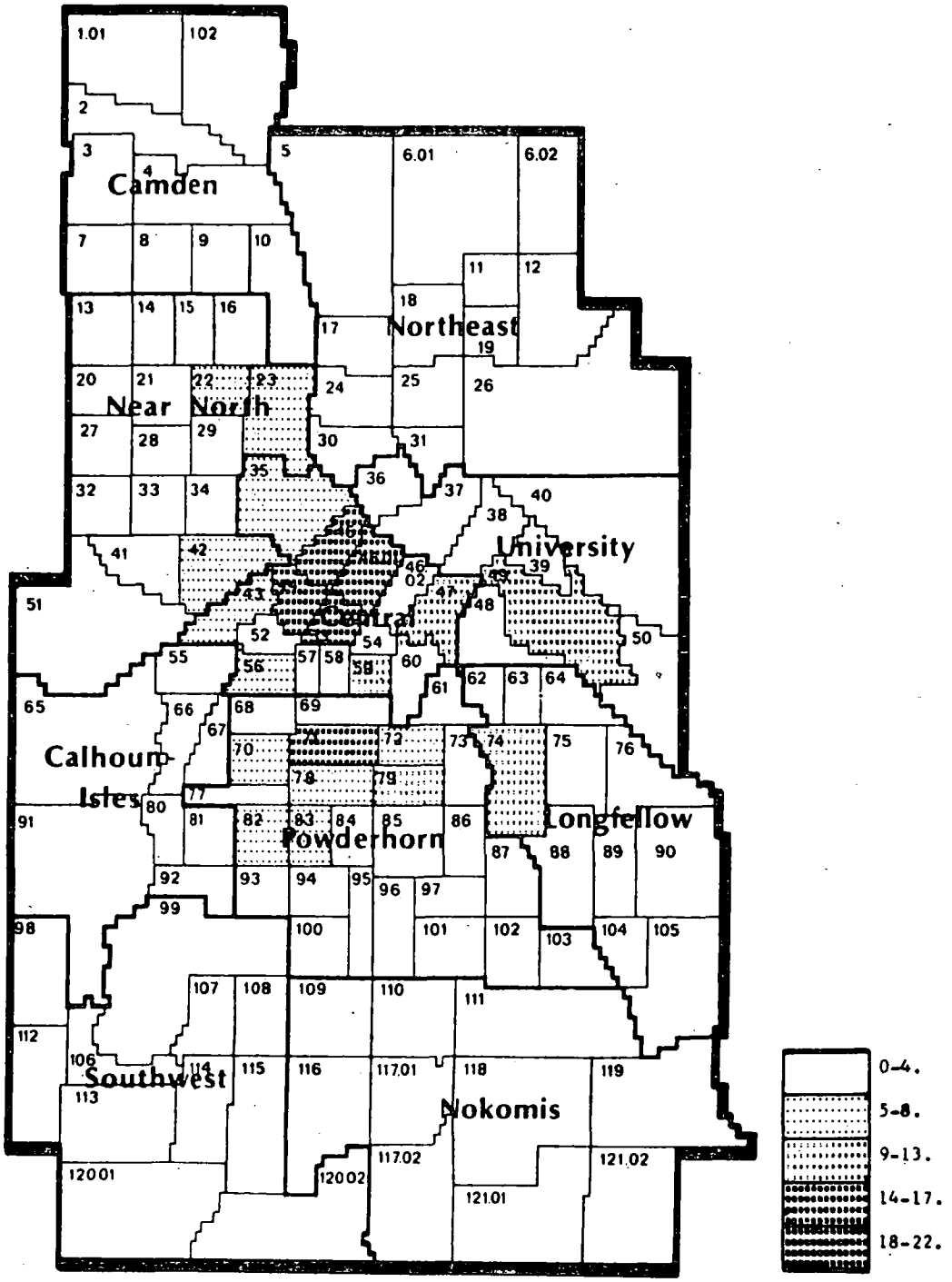


Source: Chaos City Police Offense Report Data, (N = 890), 1977.

WALK-THROUGH 'B'

A detailed analysis of parking garages and lots suggests that the Central, Powderhorn and University communities are most subject to auto theft at these types of sites.

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

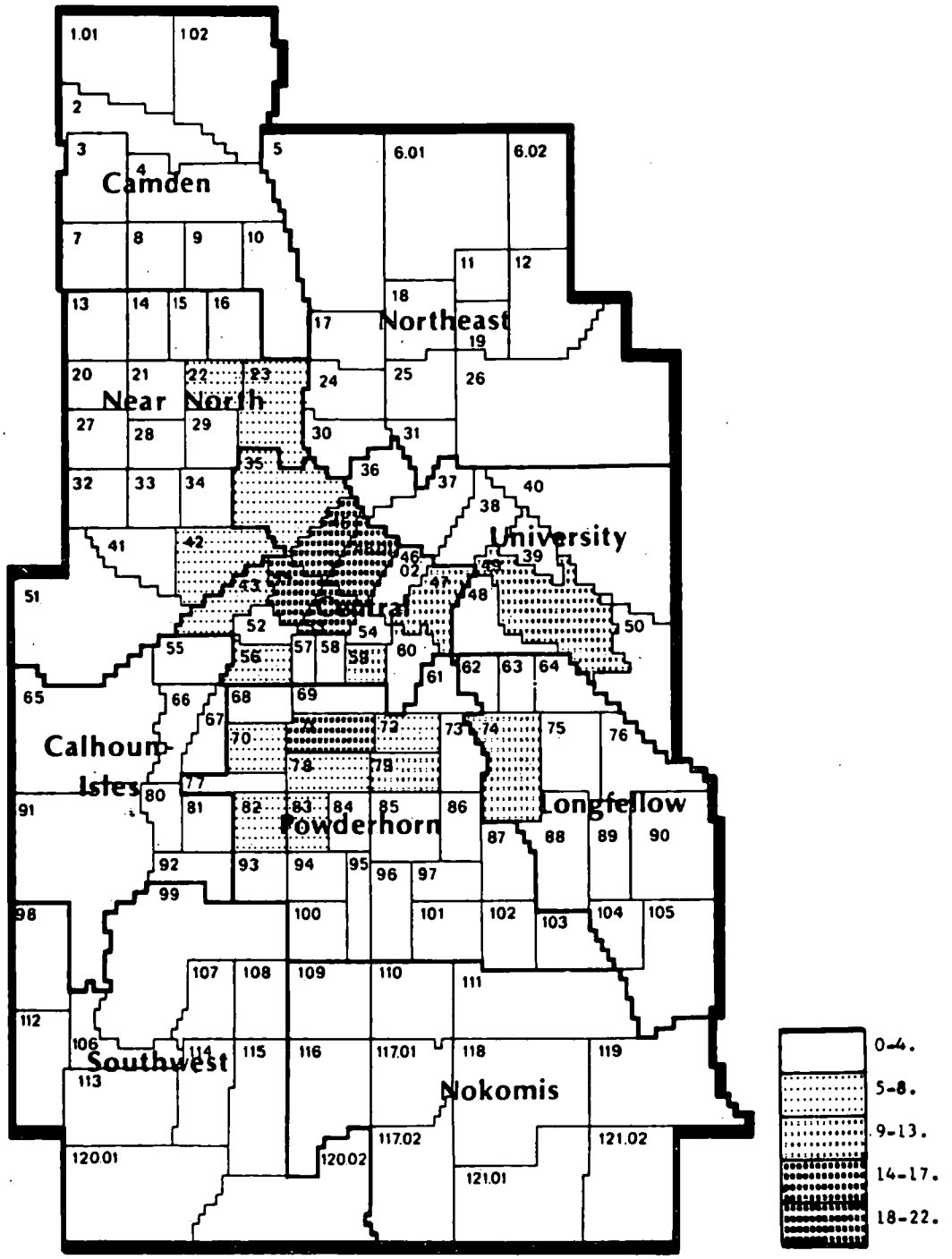


Source: Chaos City Police
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WALK-THROUGH 'B'

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



Source: Chaos City Police
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WALK-THROUGH 'B'

3.5 Auto Thefts are Deterred by Reducing Opportunities to Steal

Recent advertising campaigns have suggested that many autos are stolen because of carelessness on the part of the owner. More specifically, these ads suggest that many vehicles are stolen because keys are left in the ignition and that further, locking one's vehicle is sufficient deterrence for auto theft.

Initial data do not support the hypothesis. Data indicate that auto theft is deterred by reducing the opportunity to steal. Most victims report that the keys were not left in the vehicle. 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. Data also indicate that 57 percent of all victims reported that the car was locked when stolen. These figures, of course, may conceal deliberate misreporting by the victims. The misreporting may be caused by fear of insurance repercussions or by feelings of incompetence.

Clearly, the simple precaution of removing the keys and locking the auto, though increasing the difficulty of theft, is not by itself adequate to deter theft. However other data dealing with opportunity support the hypothesis.

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.

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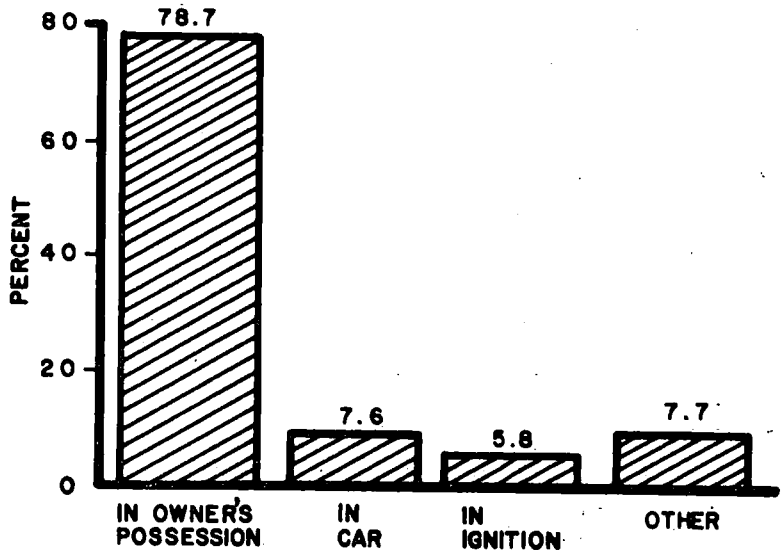
[5]"Preliminary Study of the Effectiveness of Auto Anti-Theft Devices," NILECJ, (Washington, D.C.: October 1975), p, 1.

WALK-THROUGH 'B'

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.

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, 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. Thus, these data support the general hypothesis.

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



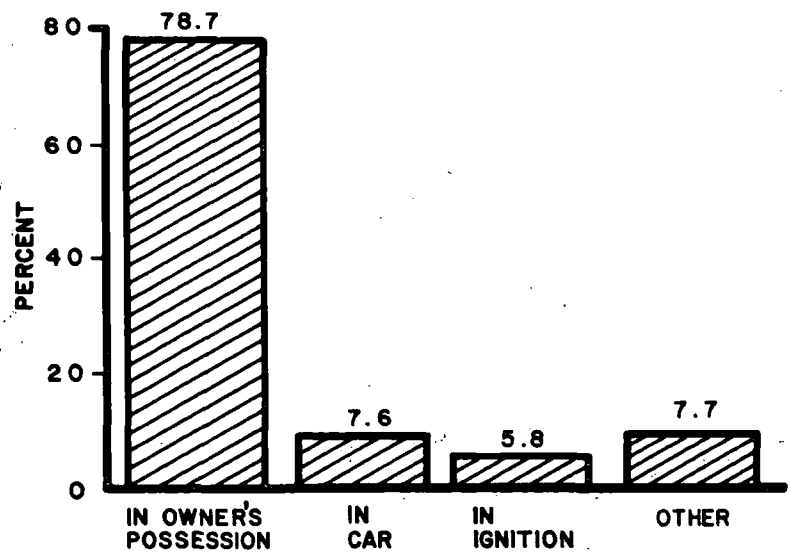
Source: Chaos City Police Offense Report Data. (N = 844), 1977.

WALK-THROUGH 'B'

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

WALK-THROUGH 'B'

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.

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)

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

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

WALK-THROUGH 'B'

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WALK-THROUGH 'B'

3.6 Characteristics of Motor Vehicle Theft may Vary by Type of Vehicle

The characteristics of truck and motorcycle theft were anticipated to be similar to that of autos. Generally the data supports this anticipation. However, there are some differences. Trucks tend to be taken from parking lots and garages 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 garages 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.

3.7 Most Suspects of Auto Theft are Amateur Thieves

Because of the high recovery rate of stolen autos, it was hypothesized that most suspects of vehicle theft are amateur thieves.

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 or stripping for parts suggesting that most thefts are not thefts for personal gain. Nonetheless, the police clear only 10 percent of their crimes through arrest.

3.8 Those Suspected of and those Arrested for Auto Theft are Generally Young

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. However, most of those arrested (76 percent) had a prior record. Unfortunately, additional reliable information is lacking from police offense reports.

WALK-THROUGH 'B'

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[1]Chaos City Police Department, 1977.

4.0 Discussion

4.1 Findings Relative to Expressed Concerns

These findings do indicate that aside from the presumed recent rash of auto thefts from downtown, theft of vehicles is a problem in the downtown area relative to other areas of the city. As might be expected the problem downtown is one of theft from garages and lots. The concentration of thefts from downtown does indicate that local merchants may have reason for concern. However, it could not be determined if the problem in downtown Chaos City is significantly different than might be expected in other cities of similar size.

Theft of vehicles, although potentially one of the most expensive property crimes in Chaos City, appears to be relatively inexpensive. The total net property loss from vehicle theft for the one-year study period was about $1,175,000. The recovery rate of autos and the risk of auto theft suggest that in a broad perspective the problem is not a serious one.

4.2 Limitations

There are no data to indicate whether there has been a recent increase of vehicle thefts from the downtown area or whether the publicity has created the appearance of an upsurge in vehicle theft. Data on a weekly or monthly basis would detect this trend but these data are unavailable.

Vehicle data, also, was unavailable on downtown areas in other cities of similar size. Thus, the magnitude of the downtown problem can only be assessed in relation to non-business areas in Chaos City. It is very possible that cities of similar size experience a similar geographic distribution of vehicle theft.

Limited suspect data does not permit a determination whether recent auto thefts are part of a professional auto theft ring or merely the random attack on the downtown area by the usual amateur. Answers to these questions require more data and analysis.

Public perception of auto theft in downtown Chaos City has not been assessed. Therefore, it is largely unknown if the businessman's fear is reflective of shopper's concerns about crime.

WALK-THROUGH 'B'

5.0 Summary

5.1 Highlights

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

Large numbers of auto thefts are of cars parked at garages or lots (40 percent of all thefts). Most of these thefts from garages and lots occur in a very few localized parts of the Central, University and Powderhorn communities.

Locking cars and removing the keys may tend to reduce the risk of auto theft. However, large numbers of autos 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 vehicle theft. While vehicles equipped with these locking systems are taken, they are stolen at a much lower rate.

The recovery rate for auto theft is higher than the national average, however, the clearance rate is lower.

Thefts of trucks and motorcycles are similar to auto thefts in some aspects but differ in regard to type of premise on which theft occurs. Motorcycles also are recovered at a much lower rate than are autos and trucks.

The profile of the suspect is largely undetermined by specific data. However, amateur involvement is highly likely because of apparent nonconcern about theft for monetary gain and because of the high recovery rate.

WALK-THROUGH 'B'

5.2 Conclusions

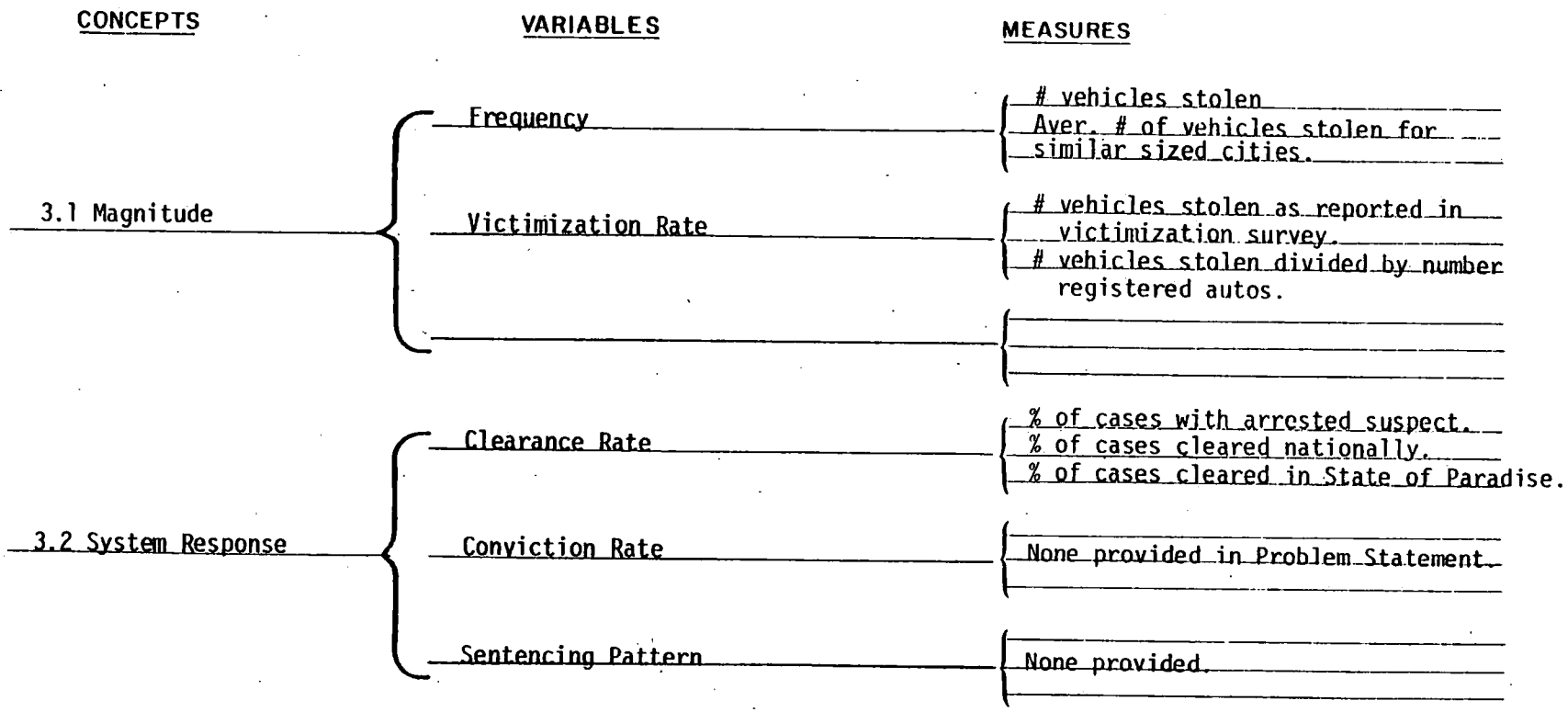
Motor vehicle theft does not appear to be a major problem in dollar loss because of a high recovery rate but in consideration of sheer volume of thefts with accompanying costs of inconvenience and police investigation there is clearly a significant problem. As might be expected the problem does not occur evenly in all areas of the city. The downtown and two other areas disproportionately share the burden of vehicle theft. The general sites of theft suggests that crime reduction planning could focus on parking garages and lots. The low clearance rate of these thefts and high recovery rates plus possible involvement of juveniles suggests that preventive measures in addition to investigation and apprehension may offer significant return on the crime reduction effort.

This analysis did not specifically identify what factors caused the perceptions of the downtown businessmen. Therefore, conclusions cannot be drawn about the nature of change needed to improve their perceptions of downtown motor vehicle theft and its impact on trade.

WALK-THROUGH 'B'

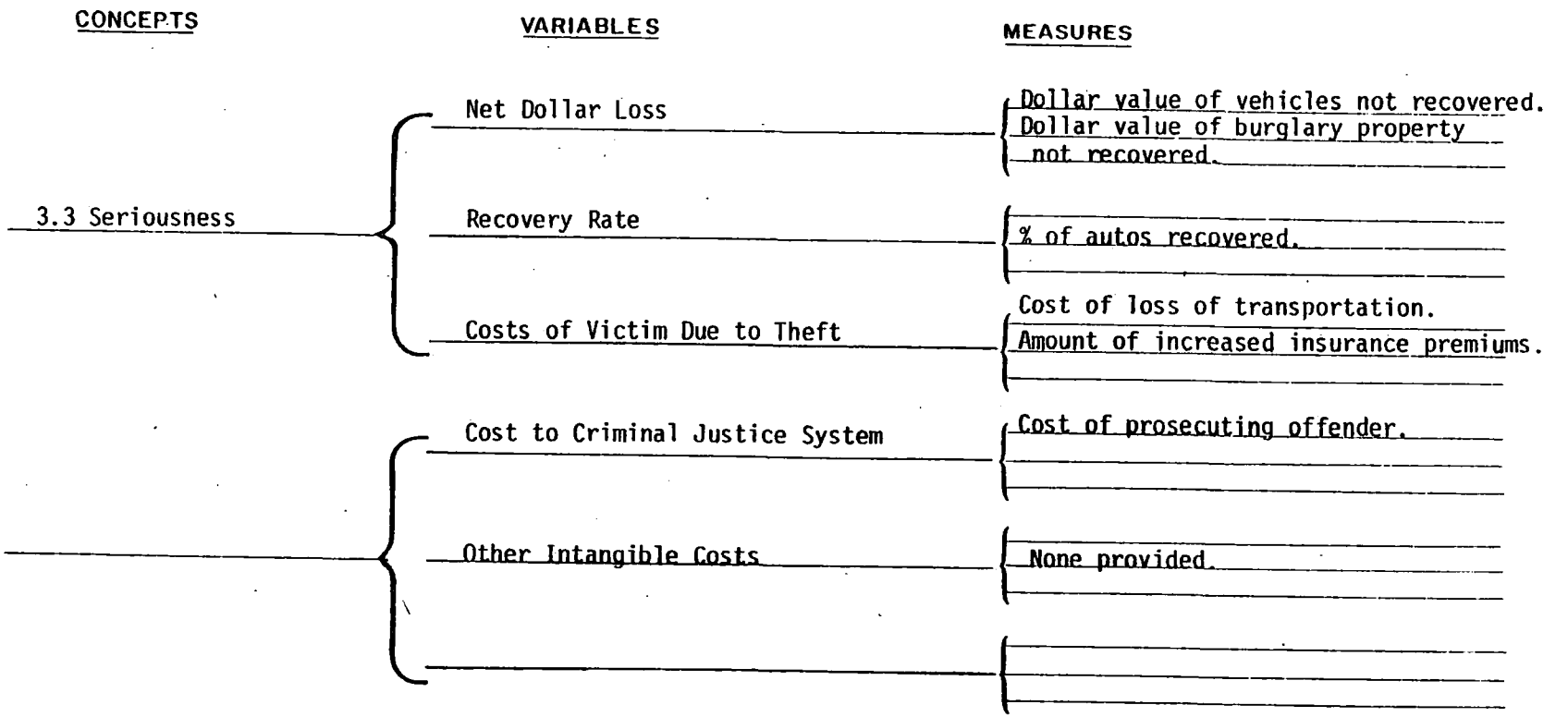
Source: Adapted from Douglas W. Frisbie, et. al. Crime in Minneapolis: Proposals for Prevention, May 1977. Minnesota Crime Prevention Center, 2344 Nicolett Avenue, Minneapolis, Minnesota 55404, pp. 191-202.

WORKSHEET
WALK-THROUGH B, PART A
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES



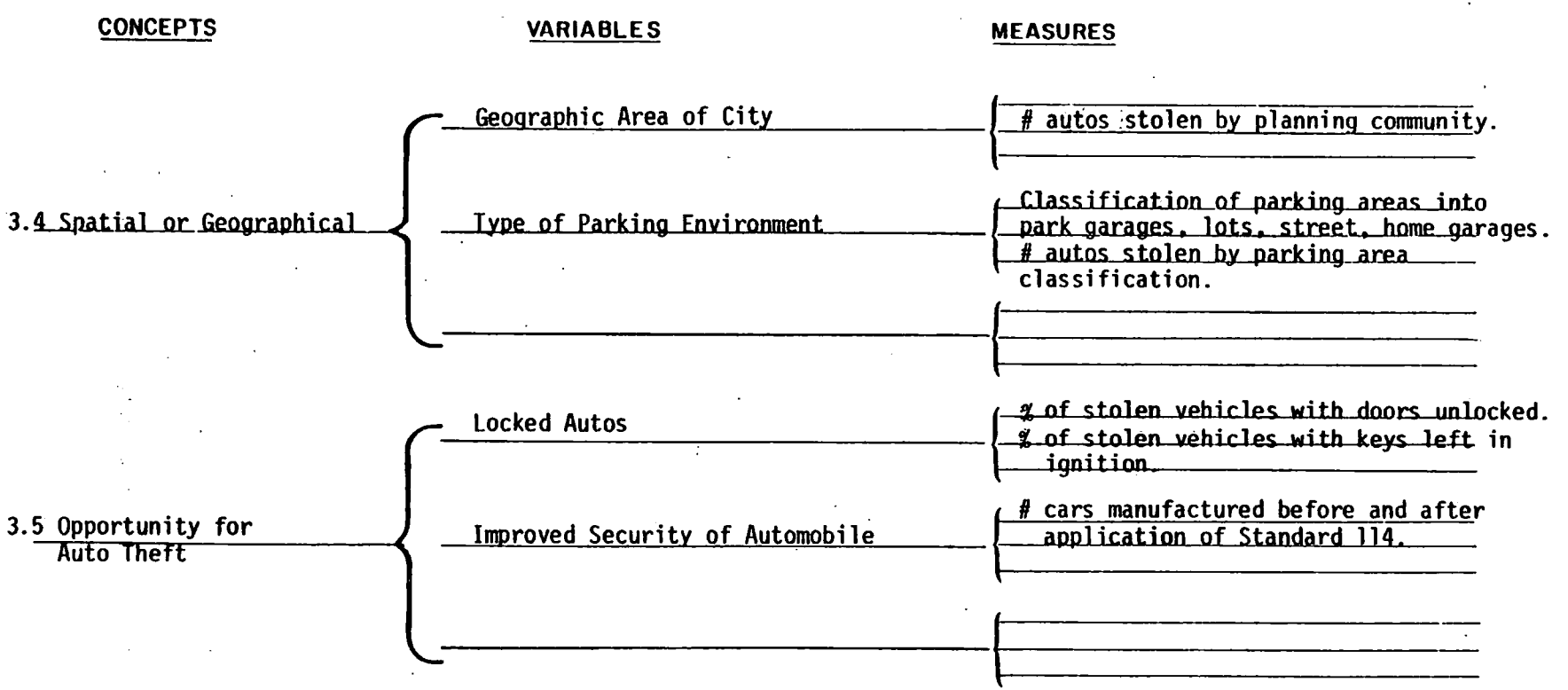
WALK-THROUGH 'B'

WORKSHEET
WALK-THROUGH B, PART A (CONTINUED)
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES



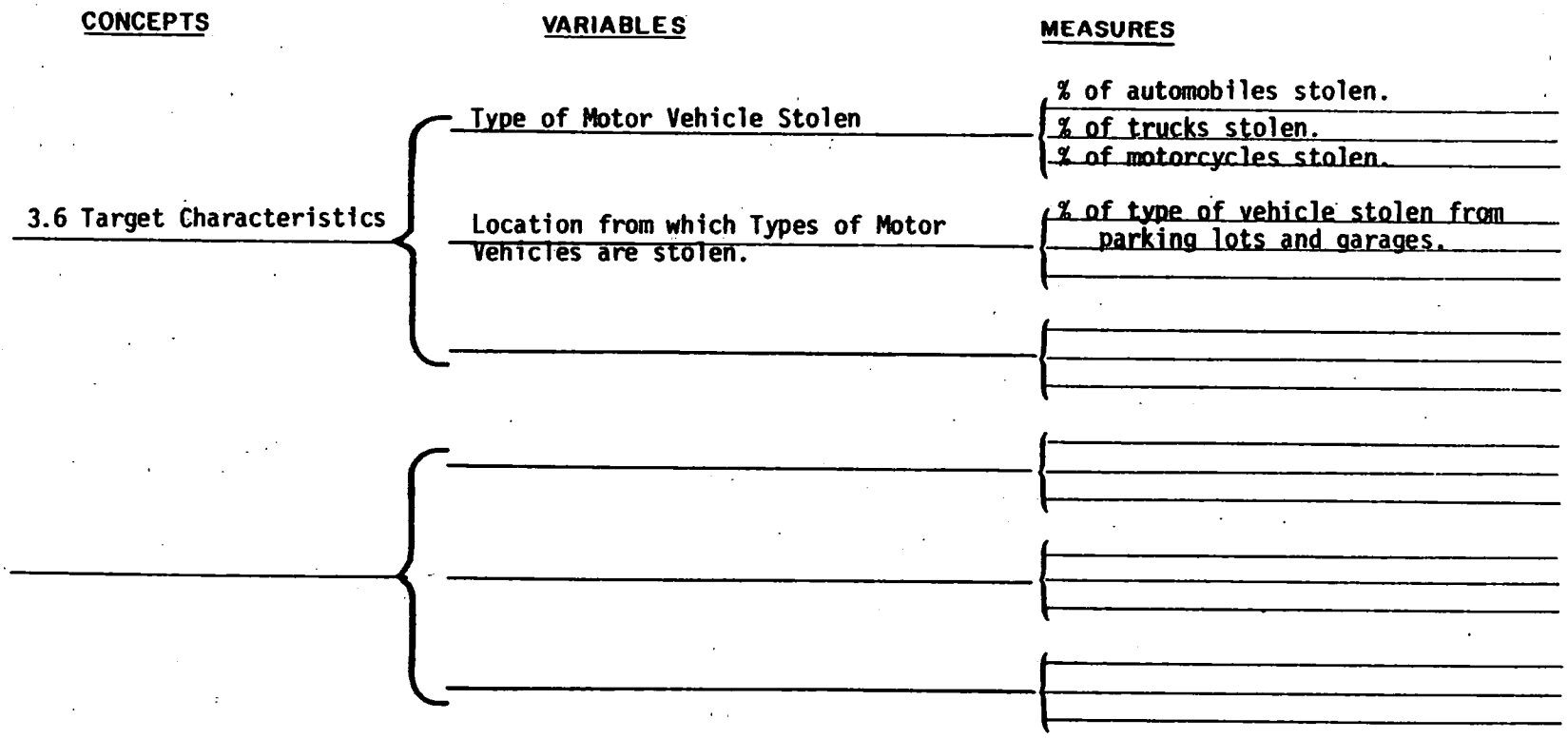
WALK-THROUGH 'B'

WORKSHEET
WALK-THROUGH, B, PART A (CONTINUED)
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES



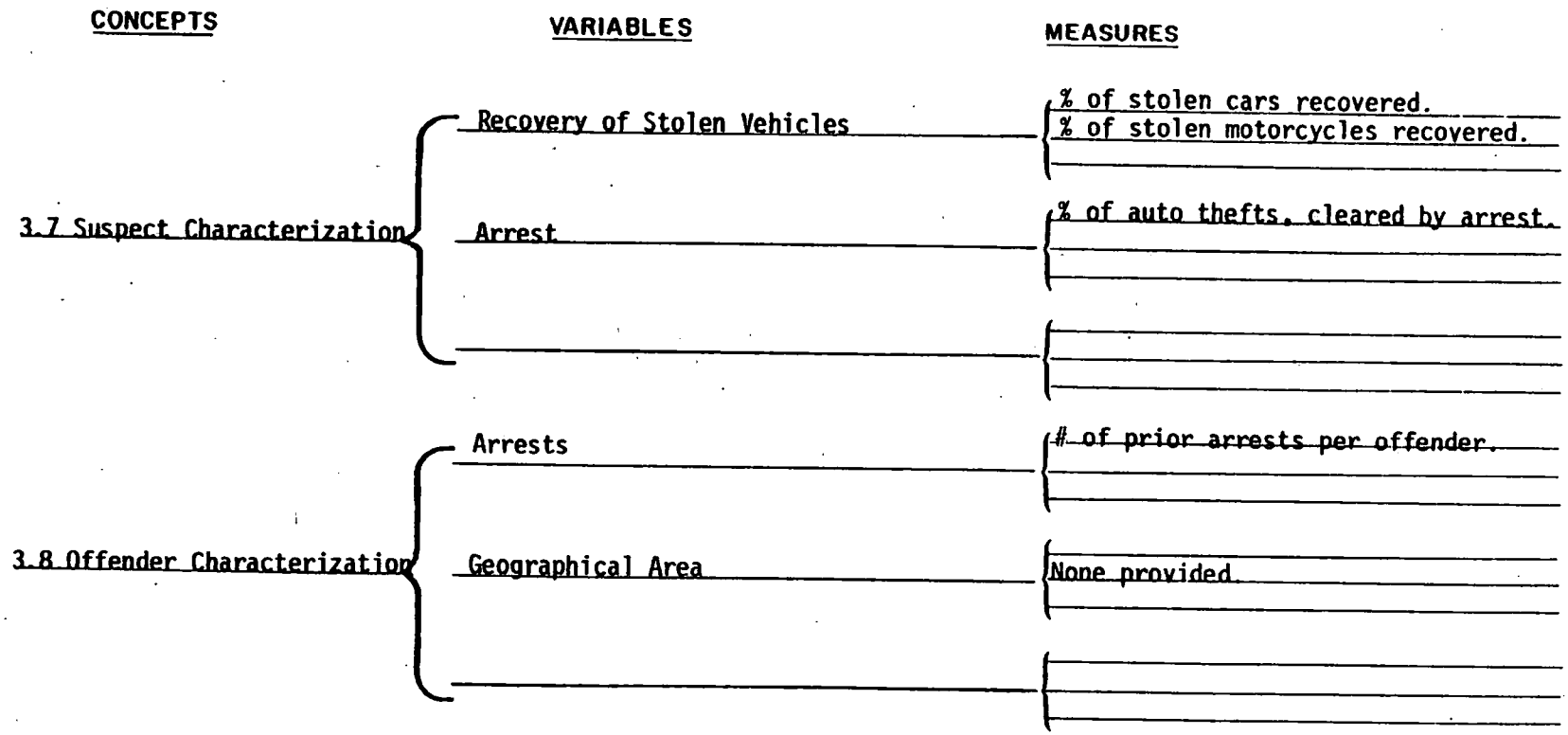
WALK-THROUGH 'B'

WORKSHEET
WALK-THROUGH B, PART A (CONTINUED)
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES



WALK-THROUGH 'B'

WORKSHEET
WALK-THROUGH B, PART A (CONTINUED)
PROBLEM SPECIFICATION: ELABORATING CONCEPTS, VARIABLES & MEASURES



WALK-THROUGH 'B'

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.1 The magnitude of motor vehicle theft in Chaos City is similar to the magnitude of the motor vehicle theft in similar size cities.	a. The frequency of motor vehicle theft in Chaos City is the same as the national average for similar size cities.	1) Number of vehicles stolen in Chaos City is the same as national average number of vehicles stolen for cities of 375,000 - 400,000 population, as reported in Uniform Crime Reports (UCR).

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES
(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.2 1. Chaos City's Criminal Justice System's response to vehicle theft is the same as the national and state response to vehicle theft.	a. The clearance rate for vehicle theft in Chaos City is the same as the national clearance rate.	1) The percentage of vehicle thefts cleared by arrest in Chaos City is the same as the percentage cleared by arrest nationally.
	b. The clearance rate for vehicle theft in Chaos City is the same as the clearance rate for the State of Paradise.	1) The percentage of vehicle thefts cleared by arrest in Chaos City is the same as the percentage cleared by arrest in the State of Paradise.

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES
(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.3 Auto theft is a less serious crime than other property crimes.	a. The net dollar loss for vehicle theft is less than that for residential burglary.	1) The reported dollar value of unrecovered vehicles is less than the reported value of unrecovered burglary property.
	b. The recovery of stolen cars in Chaos City is higher than the national recovery rate.	1) The percent of cars recovered in Chaos City is greater than the percent of all cars recovered nationwide.
	c. (Because of the costs of auto theft to victims, auto theft is a more serious problem than the net dollar loss suggests.)	1) (The reported dollar value of unrecovered vehicles, the replacement costs for stolen cars and increased insurance premiums are greater than the reported value of burglary property.)

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES
(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.4 1. The magnitude of auto theft varies by geographical area of the city.	a. The frequency of auto theft varies by area of the city.	1) The number of auto thefts varies by the city's planning communities.
	b. The risk of auto theft varies by area of the city.	1) The proportion of autos stolen to autos registered varies by the city's planning communities.
3.4 2. The magnitude of auto theft varies by parking environment.	a. Auto theft from parking lots and garages is greater than from open streets.	1) The percentage of auto thefts from parking garages and lots is greater than the percentage of auto thefts from streets.

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES
(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.5 Auto theft is deterred by reducing the opportunity to vehicles.	a. Locking autos deters auto theft.	1) Locked cars are stolen less often than unlocked cars.
	b. Autos with improved security systems are stolen less often than vehicles without improved security.	1) For vehicles manufactured after the implementation of Standard 114 the percent that are stolen is less than the percent stolen of autos manufactured before the implementation of Standard 114.

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES

(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.6 Characteristics of motor vehicle theft	a. The rate of vehicle theft is the same for all vehicles.	1) None provided.
	b. The rate of vehicle theft from parking lots is the same for all vehicle types.	1) The percent of trucks, motorcycles and cars stolen from garages and lots is the same.
	c. The recovery rate is the same for all types of vehicles.	1) The percent of stolen trucks, motorcycles and autos recovered is the same.

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES
(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES
3.7 The majority of vehicle suspects.	a. The majority of auto theft suspects are amateur thieves.	1) Because most stolen vehicles are not resold or stripped, most suspects are amateur thieves.
3.8 Auto thieves are young.	a. More auto theft suspects are juveniles than adults.	1) The percentage of juvenile auto theft suspects is greater than the percentage of adult auto theft suspects.
	b. More persons arrested for auto theft are under 21 than over 21 years of age.	1) The percentage of persons under 21 arrested for auto theft is greater than the percentage of persons over 21 arrested for auto theft.

IV. RELATIONSHIP OF PROBLEM SPECIFICATION TO THE PROBLEM STATEMENT

A. The difference between a concern and a problem.

1. Concerns frequently are:

a. Hunches based on limited observation.

b. Conclusions drawn from incomplete, unrepresentative and/or unreliable data.

c. Reactions to symptoms.

2. Problems are:

a. Conditions that deviate from a norm or standard that is acceptable in a given community.

b. A conclusion that is based on representative and reliable information.

c. Generally caused by factors that are not readily apparent.

B. Importance of a Problem Statement:

1. The complexity of most criminal justice problems requires a fairly rigorous and iterative analysis in order to describe, draw conclusions about and understand the primary causes.

2. Because problem analysis may be intricate, may use large amounts of data, and often involves statistical computations, it is important that the problem statement have an easily understood structure and be focused on important concerns. Problem specification helps to achieve these objectives of analysis. Consequently, problem statements that are developed using this process are more likely to have an impact on decision making.

C. In this course the term Problem Statement has a very specific meaning. In effect, one of the primary purposes of the course is to provide instruction and limited practice in the development and production of the problem statement.

D. Definition of a Problem Statement: A written document or oral presentation which comprehensively describes the nature, magnitude, seriousness, rate of change, persons affected, spatial and temporal aspects of a problem using qualitative and quantitative information. It identifies the nature, extent, and effect of system response; makes projections based on historical inferences, and rigorously attempts to establish the origins of the problem.

Instructor Note: Make sure participants understand this definition.

V. CONCLUSION

A. The quality of a Problem Statement may be threatened by inadequate problem specification.

1. The problem statement may not accurately represent actual or "real" concerns.

2. The concepts and measures used may not be valid.

3. The problem statement may be based on illogical relationships.

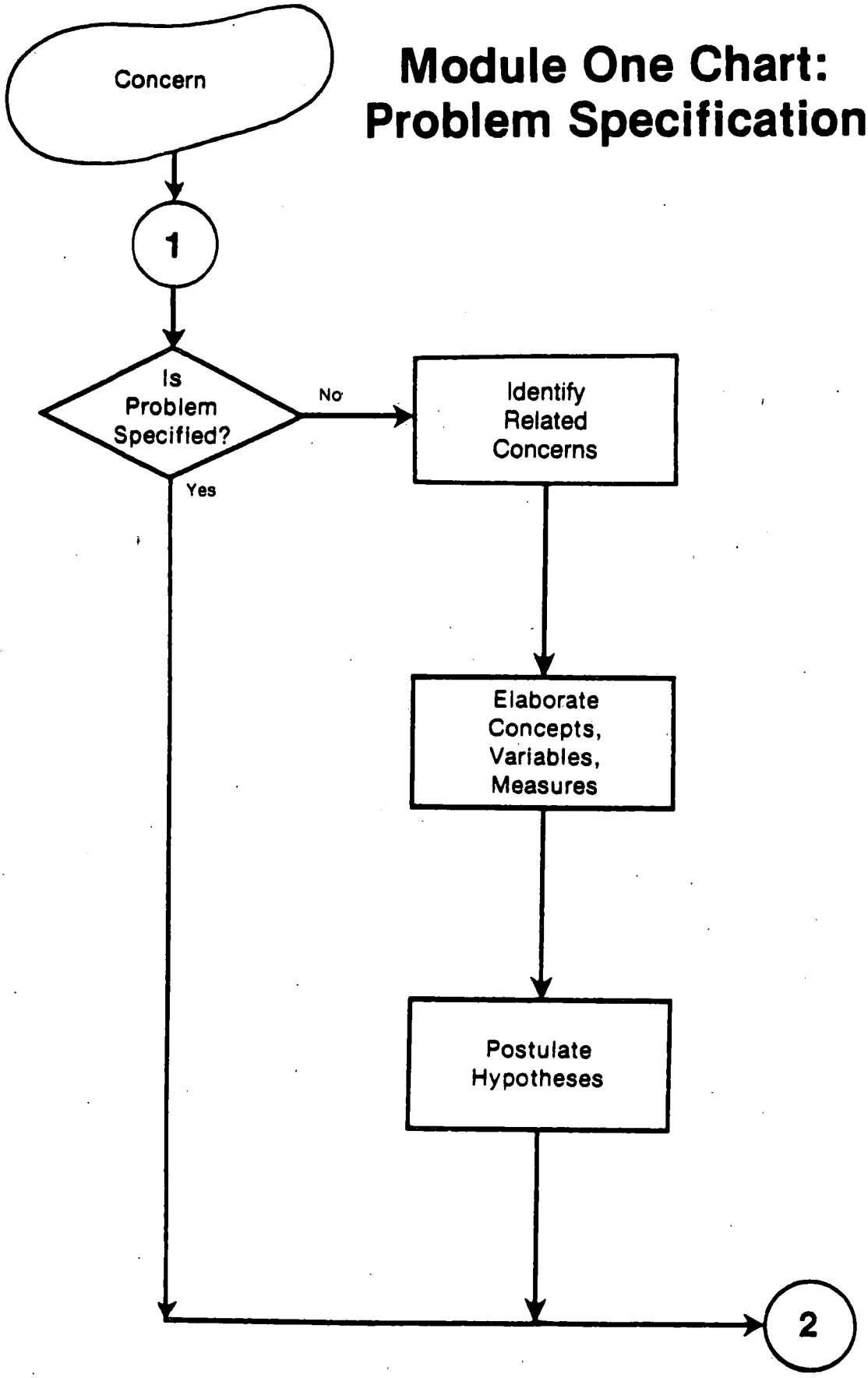
4. It may not use important conceptual relationships to drive the analysis.

5. It may not make good use of the best 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.

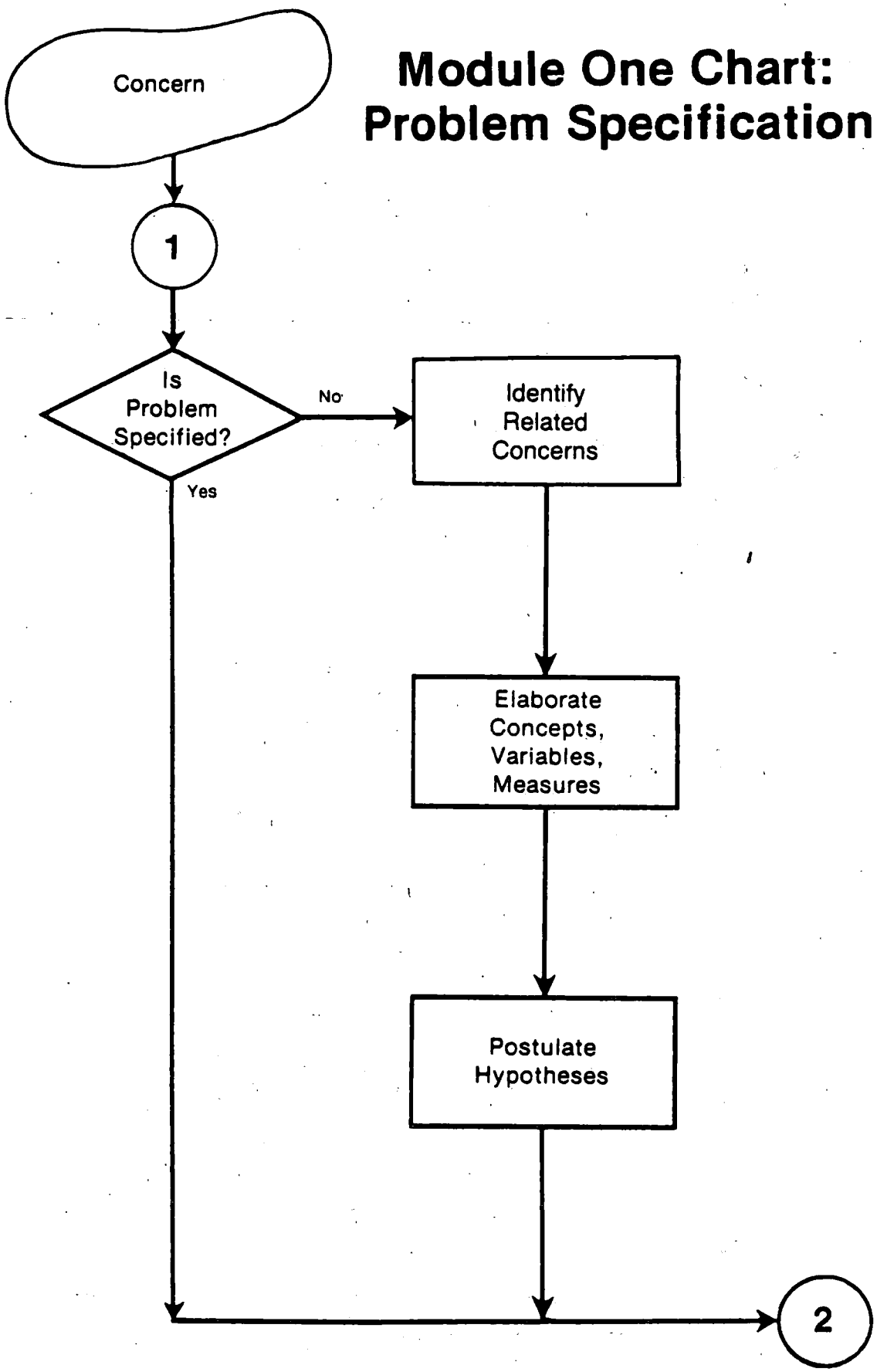
SHOW V.A. (1-5):

Module One Chart: Problem Specification



SHOW V.A. (1-5):

Module One Chart: Problem Specification



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) assessing hypotheses, (3) sources of data, and (4) planning a data collection effort.

The data collection portion of the module consists of Walk-Through 'C' - Preparing a Data Collection Plan (optional). The portion of the module dealing with the evaluation of postulated hypotheses provides an opportunity for summarizing much of the material contained in Module 1. Since Task #2 of the Major Exercise is also an evaluation of hypotheses, this last section of the module has added importance.

OBJECTIVES

1. To describe Types and Extent of Measurement Error.
2. To assess Hypotheses.
3. To systematically plan a Data Collection Effort.
4. To distinguish between Secondary and Primary Data.
5. To identify and describe Seven Methods of Data Collection.
6. To understand the Six Types of Secondary Data Used in Criminal Justice Analysis.

SCHEDULE - MODULE 2
DATA SYNTHESIS

TIME ALLOCATION

TOPIC	TIME	PAGE
I. MEASUREMENT	10 minutes	II-3
A. Definition	*	II-3
B. Measurement Accuracy	*	II-4
C. Factors Influencing Accuracy	*	II-5
II. ASSESSING HYPOTHESES	20 minutes	II-8
A. Criteria - Individual Hypotheses	10 minutes	II-8
B. Criteria - Set of Hypotheses	10 minutes	II-10
C. Example	*	II-11
III. DATA SOURCES	25 minutes	II-11
A. Alternative Sources	10 minutes	II-11
B. Methods of Data Collection	15 minutes	II-13
IV. PLANNING FOR DATA COLLECTION	30 minutes	II-18
A. Data Collection Plan	*	II-18
B. Example	*	II-18
Walk-Through 'C' DATA COLLECTION PLAN (Optional)	30 minutes	II-19
V. CONCLUSION	5 minutes	
A. Module Chart	*	II-24
B. Review Schedule	*	II-24
TOTAL TIME	90 minutes	

* Less than 5 minutes

NOTES

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. 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 the following:

   a. Asking kids to indicate awareness of unlawful behavior of other youths.

   b. Laboratory testing of cheating.

   c. Asking teachers to report on a child's behavior.

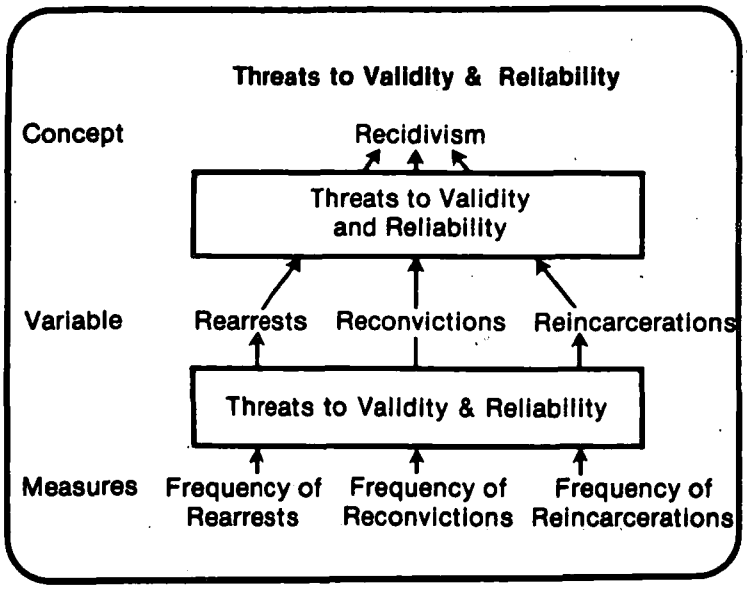
   d. Cross checking available arrest records.

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. Similar 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

NOTES

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

   - Time
   - Money
   - Organizational Considerations
   - Political Considerations

   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. 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 an Individual Hypothesis

SHOW V.A. (2-2):

CRITERIA FOR ASSESSING A HYPOTHESIS

- Measurement Accuracy
- Data Availability
- Testability
- Utility

NOTES

1. Measurement Accuracy

   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.

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

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

2. 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?

3. 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 evaluations will assist in making a hypothesis testable.

4. Utility

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

b. Are the hypotheses plausible and easily communicated?

B. Criteria for Assessing a Set of Hypotheses

1. Once the proposed hypotheses have been assessed using the criteria of measurement accuracy, data availability, testability and utility then the comprehensiveness of the remaining set of hypotheses should be considered.

2. Hypotheses used to develop a comprehensive problem statement should include, as appropriate, consideration of the following seven 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.
- Persons Affected: Considerations of the Victim, Offender, and/or Public related to the problem.

- Spatial Aspects: The geography of the problem.

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

3. 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.

C. Example of Assessing Hypotheses

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

III. DATA SOURCES

A. Alternative Data Sources

1. Primary Data:

Definition: Primary data are those data which must be collected for a particular analysis effort. These data generally are not currently available in easily useable form but can be obtained by conducting surveys and polls or from records and reports.

2. Secondary Data:

Definition: Data which have already been collected in conjunction with other analyses and are currently in easily useable 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

NOTES

3. Secondary Data Sources

SHOW V.A. (2-3):

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

a. "Actual" Crime Data

(1) These data are indicators of the types and magnitude of crime.

(2) EXAMPLE: The National Crime Panel and local victimization surveys.

b. Public Opinion Data

(1) These data are the perceptual or subjective indicators of crime or criminal justice services.

(2) EXAMPLE: National public opinion polls, political polls, local newspapers, also found in victimization surveys.

c. Reported Crime Data

(1) These data are official "crime statistics" on reported offenses and arrests.

(2) EXAMPLE: Local police department records, state UCR, special study reports that may be developed by state or regional criminal justice planning agencies.

d. Demographic Data

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

e. System Data

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

(2) EXAMPLE: Offender Based Transaction Statistics, management and administrative statistics and budget documents.

f. Juvenile Data

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

(2) EXAMPLE: Juvenile department reports, local police department reports, school records, juvenile court records, state child service agency records, federal data.

4. Factors Influencing the Selection of Primary and Secondary Data

   - 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. Methods of Data Collection

1. Six Methods of Data Collection

Instructor's Note: Quickly go over the six methods of collecting data, identifying their differences and giving examples of the more frequently used techniques.

The first three methods are usually associated with collection of primary data.

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. Experiments

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

c. Survey Research

Collecting responses to questions asked during 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 the participants may disagree with the conclusions of the authors, the process of answering the criteria questions may be of great value in selecting a survey approach.

d. Content Analysis

Systematic Study of Books, Articles and Documents.

e. 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).

f. Simulation Modeling

Simulation modeling is 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.

Module 2
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

IV. PLANNING FOR DATA COLLECTION

A. The development of a data collection plan should address these issues:

- questions to be answered
- measures
- data sources
- collection methods
- assessment
- other collection requirements
- resource requirements

B. An example of using these considerations in planning a data collection effort is illustrated in Walk-Through C. (Note: This Walk-Through is optional based on the needs of the participants and timing.)

DATA COLLECTION PLAN
(OPTIONAL)

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 to concentrate 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 this data?

Using the provided worksheet discuss the development of a data collection plan.

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, of the Walk-Through and give the group five minutes to assess the data set.

C. Lead the participants through the answer to the question concerning the Chaos City crime problem using Table 1.

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 they need to consider additional data to adequately address the concern expressed by the Chaos Crime Planning Board. Go over Table 2 and then turn to the worksheet. Discuss questions 1-7 on the worksheet. Relate these questions to the characteristics of a problem statement. Discuss the column tables and relate them to Table 2.

E. Have the participants look at Question 1 on the worksheet and suggest additional measures, data sources, collection methods, measurement accuracy, other collection requirements and resource requirements. Have them add to 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.

F. 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.

WALK-THROUGH 'C'

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.

WALK-THROUGH 'C'

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

WALK-THROUGH 'C'

Table 3. Worksheet

Questions to be answered	Measures	Data Sources	Collection Method	Measurement Accuracy	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'

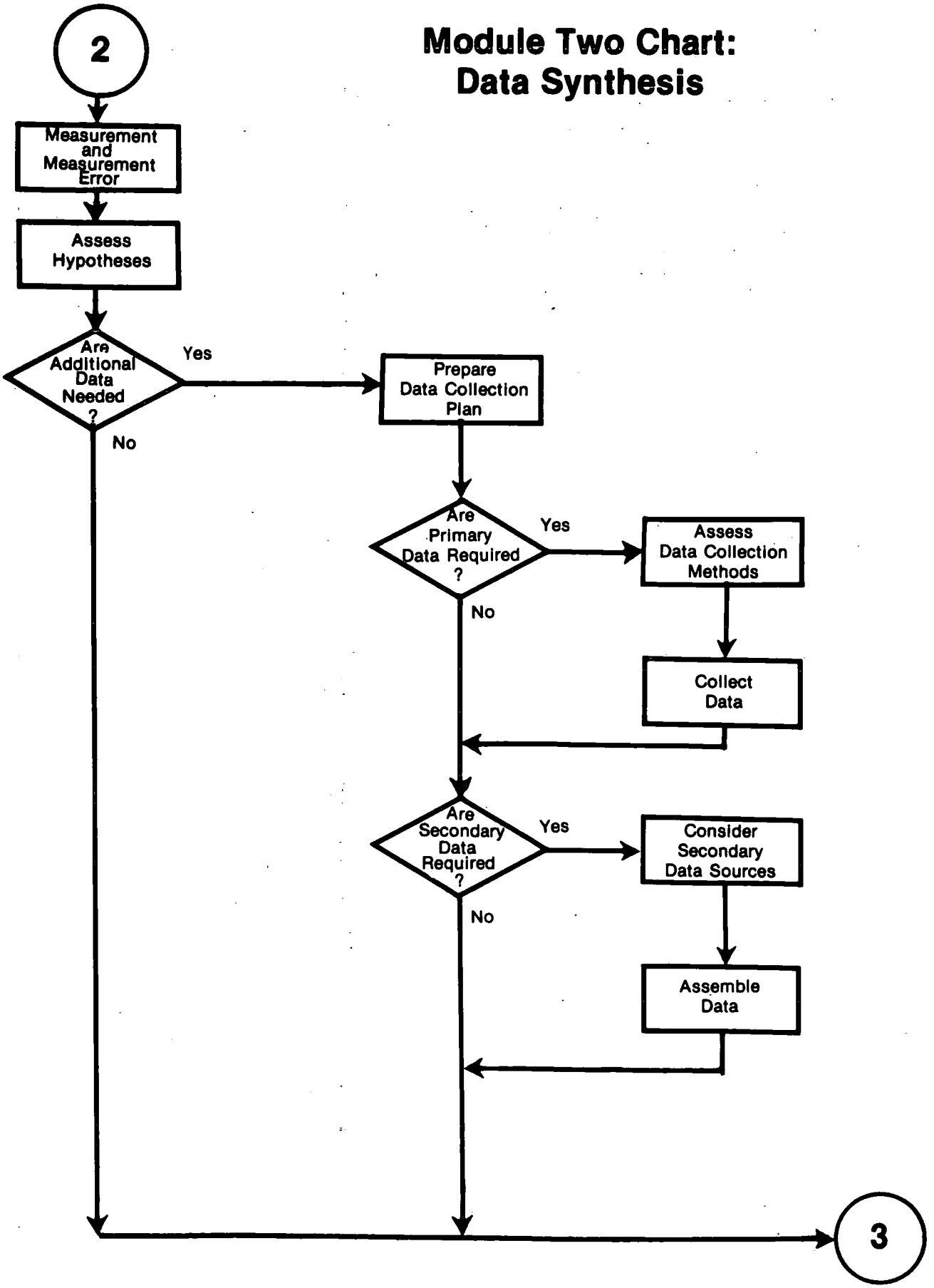
NOTES

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):


2
Module Two Chart:
Data Synthesis
Measurement and Measurement Error
Assess Hypotheses
Are Additional Data Needed ?
Yes
No
Prepare Data Collection Plan
Are Primary Data Required ?
Yes
No
Assess Data Collection Methods
Collect Data
Are Secondary Data Required ?
Yes
No
Consider Secondary Data Sources
Assemble Data
3

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 exercises 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 Module 3 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.

Equipment needed for this module include protractors, graph paper, pencils and calculators for each of the participants.

OBJECTIVES

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

2. To select, calculate and interpret:

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

3. To 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

TOPIC	TIME	PAGE
I. MEASUREMENT LEVELS	20 minutes	III-3
A. Determining Levels	10 minutes	III-3
B. Utility	10 minutes	III-6
II. STATISTICAL METHODS	80 minutes	III-6
A. Central Tendency	20 minutes	III-7
Walk-Through 'D' MEAN, MEDIAN, MODE	20 minutes	III-12
B. Variation	20 minutes	III-15
Walk-Through 'E' STANDARD DEVIATION	20 minutes	III-20
III. GRAPHICAL METHODS	55 minutes	III-23
A. Pie Charts	5 minutes	III-23
B. Bar Graphs	5 minutes	III-24
C. Histograms	5 minutes	III-25
D. Frequency Polygon	5 minutes	III-26
Exercise #1 GRAPHICAL METHODS	35 minutes	III-28
IV. TIME CHARTS/PERCENT CHANGE	15 minutes	III-34
A. Percent Change	*	III-34
B. Time Charts	*	III-35
C. Distorting Graphical Presentations	10 minutes	III-36
V. CONCLUSION	10 minutes	III-39
B. Descriptive Statistics	*	III-39
A. Review	*	III-39
TOTAL TIME	180 minutes	

* Less than 5 minutes

I. MEASUREMENT LEVELS

A. Determining Levels of Measurement

1. The way we measure affects what we can do with our data once it has been collected. How much we know about the values observed determines the level. This is called the level of measurement.

2. When all we know about the values observed is that they belong to different categories, e.g., religions. the level of measurement is called *nominal*. The nominal level of measurement allows us to say that two observations are the same or different, once measured.

3. Ordinal level measurement is possible when we add information about the ordering or sequencing of the categories.

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

   a. 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:

      - label (box 6)
      - order (6th)
      - interval (6 degrees)
      - ratio ($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.

8. Review this material using Exhibit 1.

Module 3
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 Quotient	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 $\overline{X}$ of the two middle values.

b. Because, the median is the "middle" value of a distribution, it 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.

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 the example presented (V.A. 3-5), 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 20 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. Twenty 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
Source: Sourcebook, 1976.

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

$$\overline{X} = \frac{\Sigma X}{N} = 8.2$$

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

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

Median = 5.5

Mode = 4, 8

DEBRIEFING NOTES

1. The mean is more useful than mode and median in advanced statistical analysis.
2. In small data sets the mode can be quite unstable.
3. In some data the scores do not tend centrally in a meaningful way. Rather than one measure several modes may be appropriate descriptions.
4. The mode is useful in studying characteristics of populations. For example, the mode describes the most typical case.
5. One or several extreme scores pull the mean away from the values which represents the majority of the cases. In this instance the median may be preferred.
6. Many statisticians suggest calculating all three values (mean, median, mode) in order to determine which value best describes the data.

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 AND ATTEMPTED ROBBERY W/INJURY	5	33.3
ROBBERY AND ATTEMPTED ROBBERY W/OUT INJURY	10	66.6

% 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.
+ May be used with mean, median, or mode.

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. Twenty minutes are allotted for this Walk-Through.

F. When most of the participants have completed the Walk-Through, reconvene the class and review debriefing notes.

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.
Source: Sourcebook, 1976.

WALK-THROUGH 'E'

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	$\bar{X}$	$X-\bar{X}$	$(X-\bar{X})^2$
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

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

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

D. Substitute in formula:

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

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

WALK-THROUGH 'E'

WORKSHEET (continued)

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

X	$\bar{X}$	$X-\bar{X}$	$(X-\bar{X})^2$
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
$\frac{8}{31}$	6.2	1.8	$\frac{3.24}{12.80}$

F. Find the range: Range = 4

G. Find the Mean: $\bar{X} = 6.2$

H. Find the standard deviation:

$$SD = \sqrt{\frac{\Sigma (X-\bar{X})^2}{N}} = \sqrt{\frac{12.8}{5}} = 1.6$$

DEBRIEFING NOTES

1. A common error is to confuse $\Sigma X2$ and $(\Sigma X)2$. In the event a negative value occurs under the square root sign, these two terms are likely to have been confused.

2. A rule of thumb for estimating standard deviation is that the ratio of the range to standard deviation is rarely smaller than 2 or greater than 6. If your calculations produce a ratio outside of these values, this usually indicates an error has been made.

WALK-THROUGH 'E'

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.

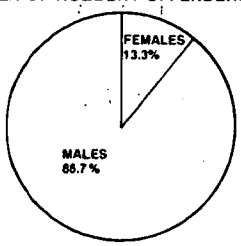
A. Pie Charts

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



N=15

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.

B. Bar Graphs

SHOW V.A. (3-12):

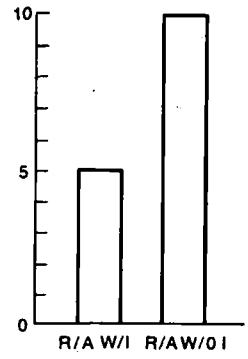
BAR GRAPHS

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 AND ATTEMPTED ROBBERY W/INJURY	5
ROBBERY AND ATTEMPTED ROBBERY W/OUT INJURY	10



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):

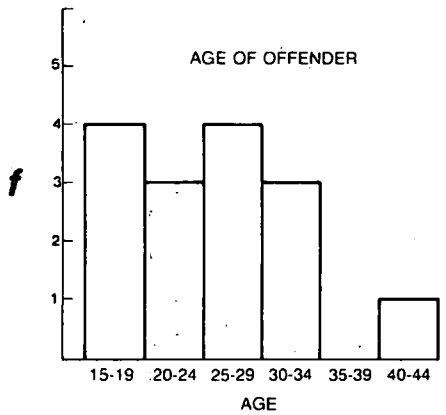
HISTOGRAM

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

  (3) It's not clear if all of the 15-19 year olds are 19 or possibly 15 years old.

+ 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.

D. Frequency Polygons

SHOW V.A. (3-14):

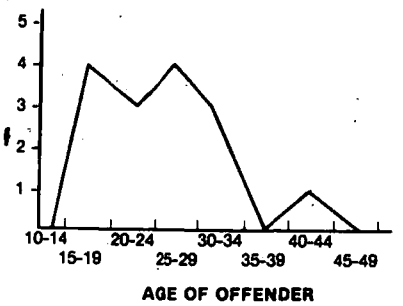
FREQUENCY POLYGON

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.

+ 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.

NOTES

+ 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. Participants will need protractors, graph paper, pencils, and calculators for this exercise. This equipment will be needed in succeeding exercises.

E. When most of the participants have completed the exercise, reconvene the class and review the debriefing notes.

F. Schedule:
Preparation - 5 min.
Activity - 25 min.
Debriefing - 5 min.

EXERCISE #1 (Continued)

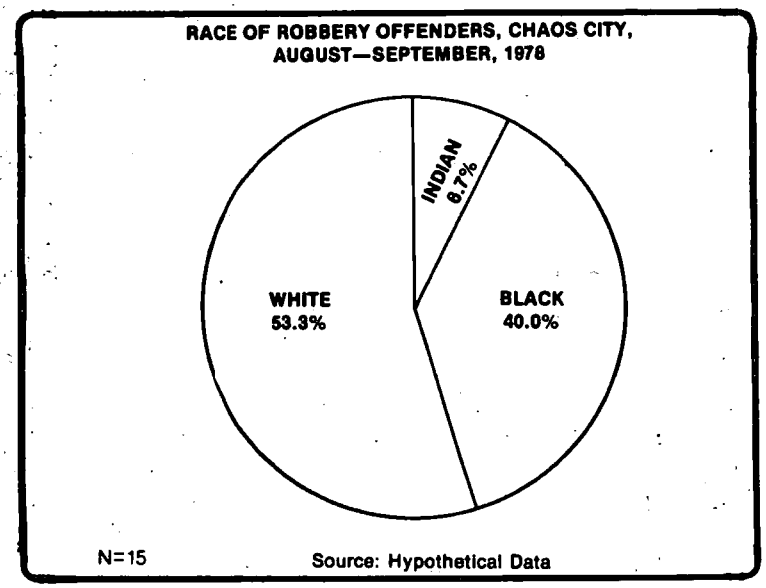
A. Race of Offender

1. Construct a Frequency Table.

Race of Offender	Frequency	Percent	Degrees
White	8	53.3	192
Black	6	40.0	144
Indian	1	6.7	24

2. Construct a Pie Chart.

SHOW ANSWER (Exercise 1-a):



EXERCISE #1

EXERCISE #1 (Continued)

B. Type of Weapon

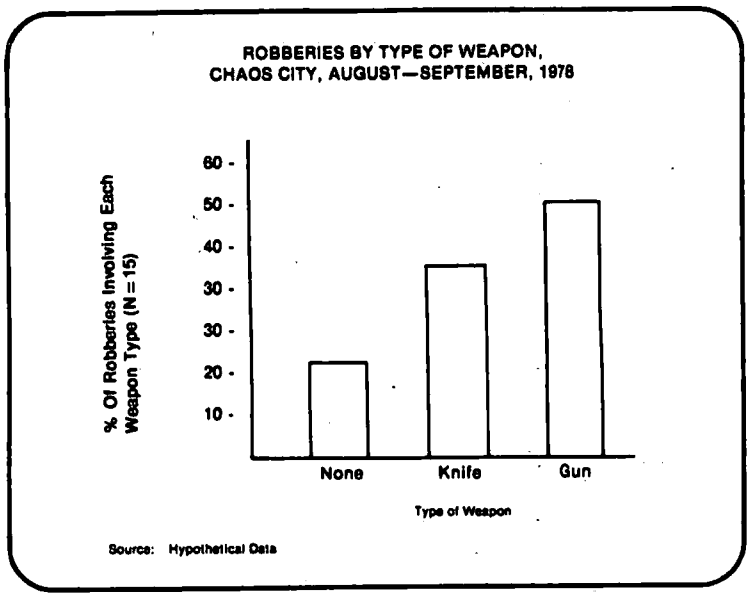
1. Calculate required values and complete the following table.

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

EXERCISE #1 (Continued)

C. Age of Victim

1. Examine the following grouped data table.

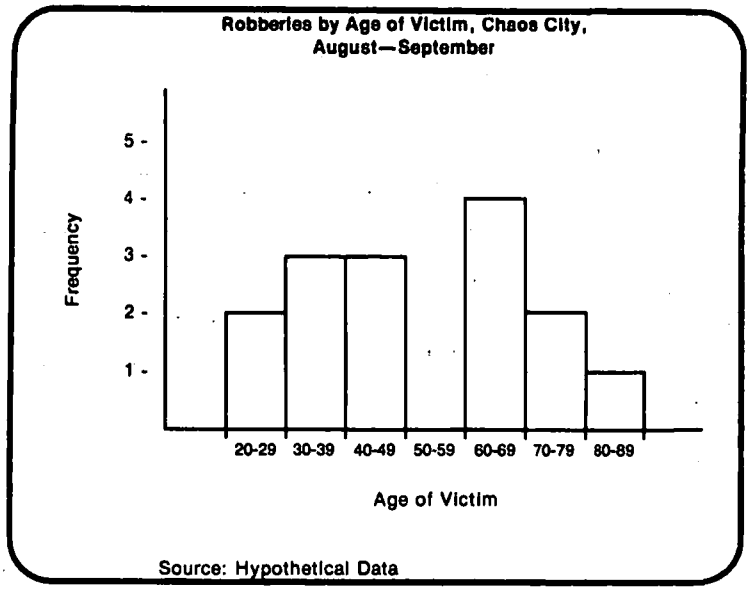
Age of Victim (Apparent Interval Limits)	Frequency
10 - 19	0
20 - 29	2
30 - 39	3
40 - 49	3
50 - 59	0
60 - 69	4
70 - 79	2
80 - 89	1
90 - 99	0

EXERCISE #1

EXERCISE #1 (Continued)

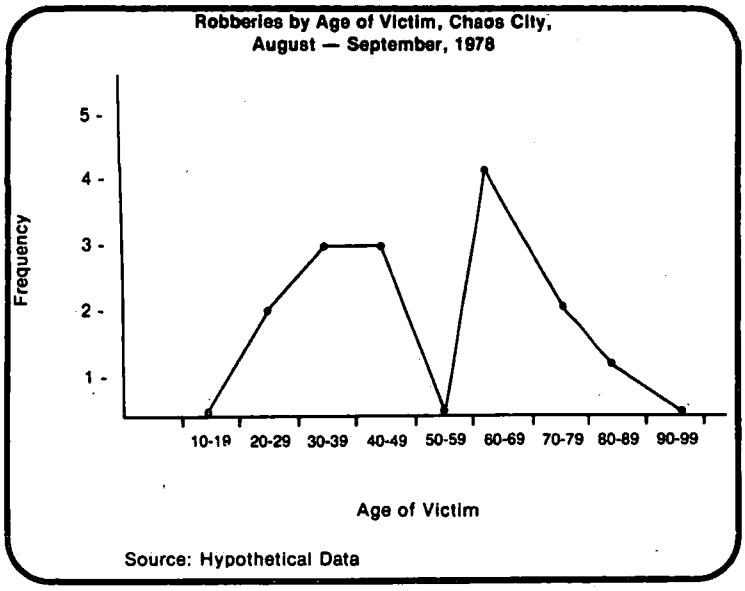
2. Prepare a histogram using the grouped data.

SHOW ANSWER (Exercise 1-c):



3. Prepare a frequency polygon using the grouped data.

SHOW ANSWER (Exercise 1-d):



EXERCISE #1

DEBRIEFING NOTES

1. Visual presentation help to make information easily understood.

2. Use circles (pie charts) when the different characteristics are all parts of a whole, e.g. race of offender.

3. A bar graph helps to compare different characteristics, e.g. type of weapon and percentage of robbery. Usually bars are arranged in order of size.

4. A histogram differs from a bar graph in that it displays continous data such as age of victim while the bar graph displays categorical data, such as weapon types.

5. Unequal intervals cause difficulty in examining visual content and in visually comparing the various aspects depicted.

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 it (changes) 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

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

Source: Hypothetical Data
*per 100,000

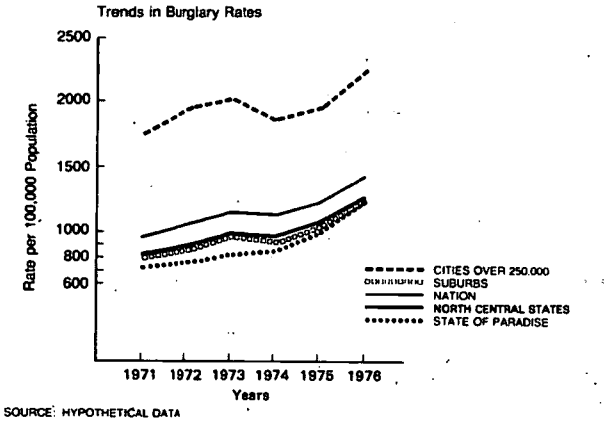
EMPHASIZE (3-15):

+ 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



SOURCE: HYPOTHETICAL DATA

EMPHASIZE (3-16):

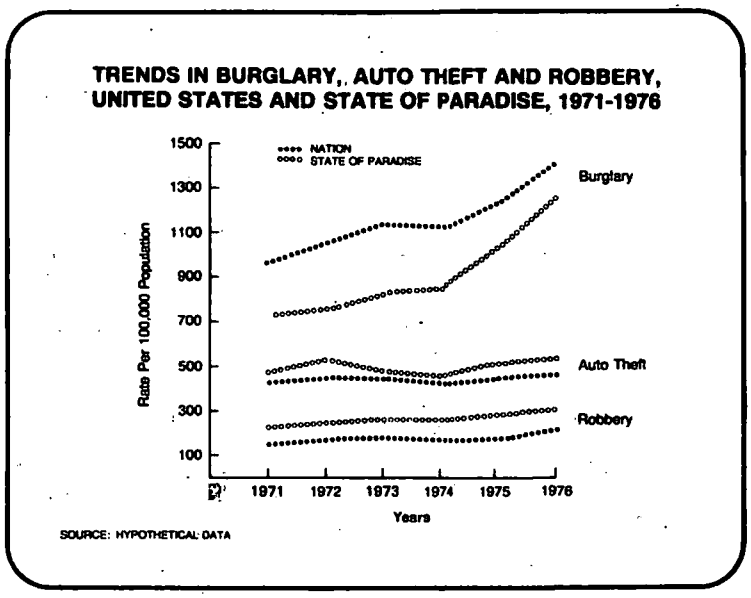
+ Trends in crime rates can be easily compared for different jurisdictions if the trends for each jurisdiction are plotted on the same set of axes.

+ 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.

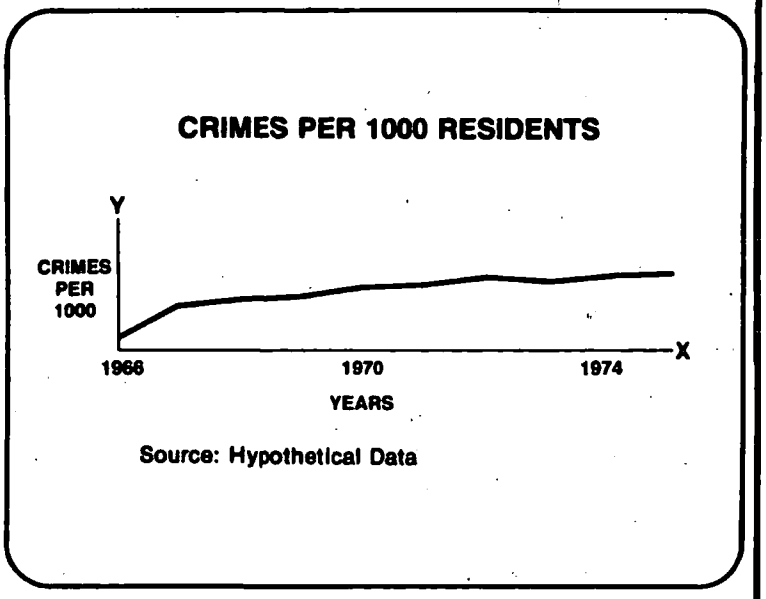
+ Note that the State of Paradise represented by the line made up of hollow circles has a lower burglary rate and higher auto theft and robbery rates than the nation, and that these rates of change remained constant between 1971 and 1976.

C. Distorting Graphical Presentations

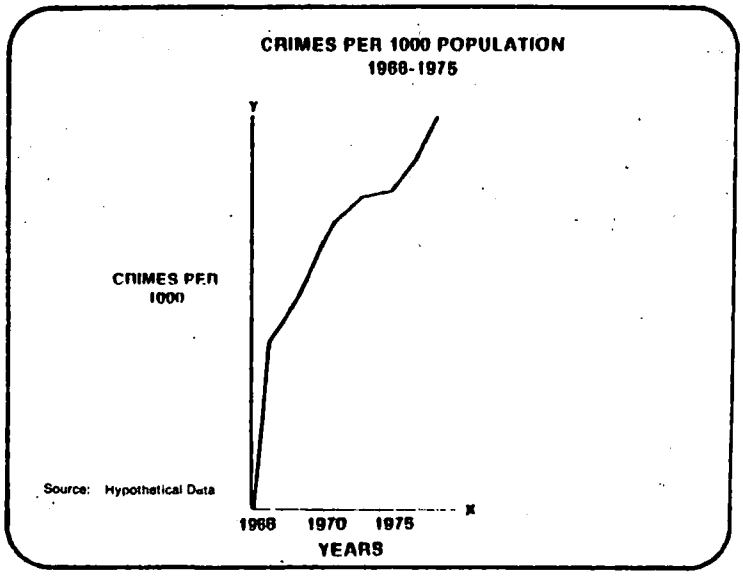
1. The 3/4 rule--Y axis should be between 75-100% of the X axis.

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

SHOW V.A. (3-18):



SHOW V.A. (3-19):



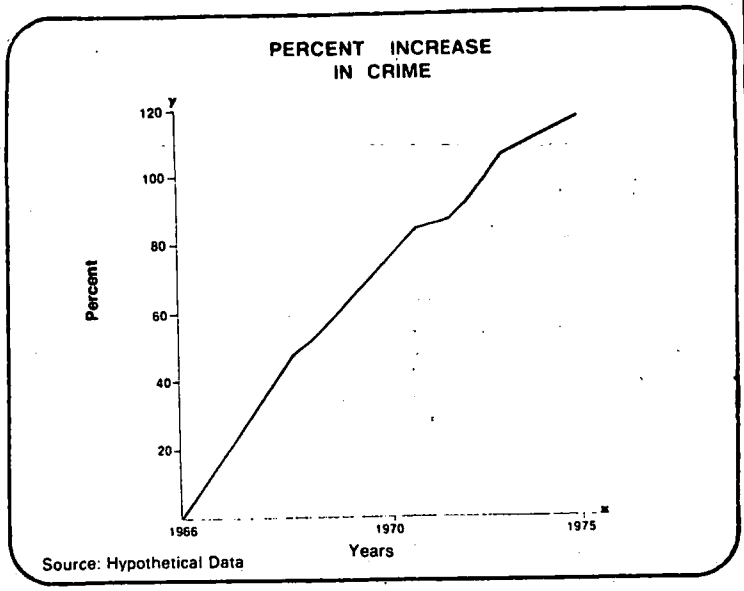
EMPHASIZE (3-19):

+ Beware of changing measurement definitions or techniques.

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

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

SHOW V.A. (3-20):



EMPHASIZE (3-20):

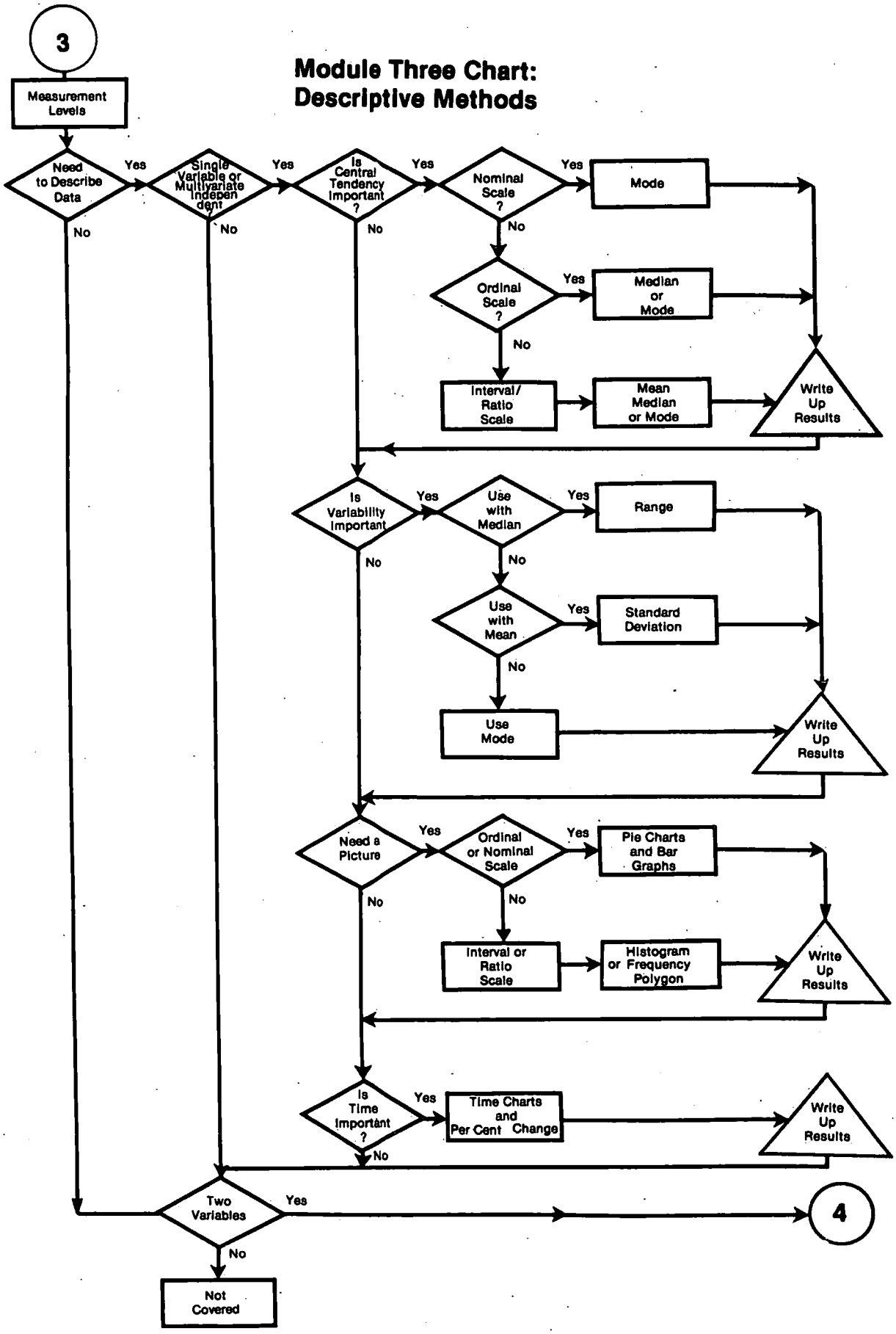
+ Reference Huff's "How to Lie with Statistics."

V. CONCLUSION

A. 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.

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

SHOW V:A. (3-21):


3
Measurement Levels
Module Three Chart:
Descriptive Methods
Need to Describe Data
Yes
No
Single Variable or Multivariate Independent
Yes
No
Is Central Tendency Important ?
Yes
No
Nominal Scale ?
Yes
Mode
No
Ordinal Scale ?
Yes
Median or Mode
No
Interval/ Ratio Scale
Mean Median or Mode
Write Up Results
Is Variability Important
Yes
No
Use with Median
Yes
Range
No
Use with Mean
Yes
Standard Deviation
No
Use Mode
Write Up Results
Need a Picture
Yes
No
Ordinal or Nominal Scale
Yes
Pie Charts and Bar Graphs
No
Interval or Ratio Scale
Histogram or Frequency Polygon
Write Up Results
Is Time Important ?
Yes
Time Charts and Per Cent Change
No
Write Up Results
Two Variables
Yes
4
No
Not Covered

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 a seriousness index, discusses the use of cross classification tables and scattergrams, and concludes with a presentation of statistical maps.

OBJECTIVES

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.

SCHEDULE

COMPARATIVE METHODS

TIME ALLOCATION

TOPIC	TIME	PAGE
I. INDEX NUMBERS	25 minutes	IV-3
A. Definition	*	IV-3
B. Rates	5 minutes	IV-3
C. Four Types	10 minutes	IV-5
D. Comparative Analysis	*	IV-10
Walk-Through 'F' INDEX NUMBERS	10 minutes	IV-12
II. SERIOUSNESS WEIGHTING	60 minutes	IV-14
A. Need	5 minutes	IV-14
B. Sellin-Wolfgang Index	10 minutes	IV-15
C. Uses of Seriousness Scale	*	IV-18
Exercise #2 SERIOUSNESS	45 minutes	IV-19
III. CROSS CLASSIFICATION	30 minutes	IV-23
A. Purpose	5 minutes	IV-23
B. Example	5 minutes	IV-23
C. Percentaging a Table	5 minutes	IV-25
Walk-Through 'G' CROSS CLASSIFICATION TABLES	15 minutes	IV-26
IV. SCATTERGRAMS	20 minutes	IV-29
A. Definition	5 minutes	IV-29
B. Construction/Interpretation	5 minutes	IV-29
Walk-Through 'H' SCATTERGRAM	10 minutes	IV-30
V. STATISTICAL MAPS	10 minutes	IV-34
A. Importance	*	IV-34
B. Principals	*	IV-34
C. Spatial Characteristics	5 minutes	IV-36
VI. CONCLUSION	5 minutes	IV-41
A. Review	*	
TOTAL TIME	150 minutes	

* Less than 5 minutes

I. INDEX NUMBERS

A. An index number consists of a:

$$\frac{\text{numerator}}{\text{denominator}}$$

It is a ratio of two measures.

B. 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.

   a. 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.

NOTES

2. Deriving crime rates for populations at risk represents one way of achieving comparability.

   a. When this method is used for specific crimes, however, the meaning of "rate" is to be interpreted as a "risk" of victimization.

   b. Greater care must be taken in choosing the denominator which is used to calculate the rate.

   c. 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.

   d. Example: 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.

   e. The following denominators should be considered:

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

3. 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.

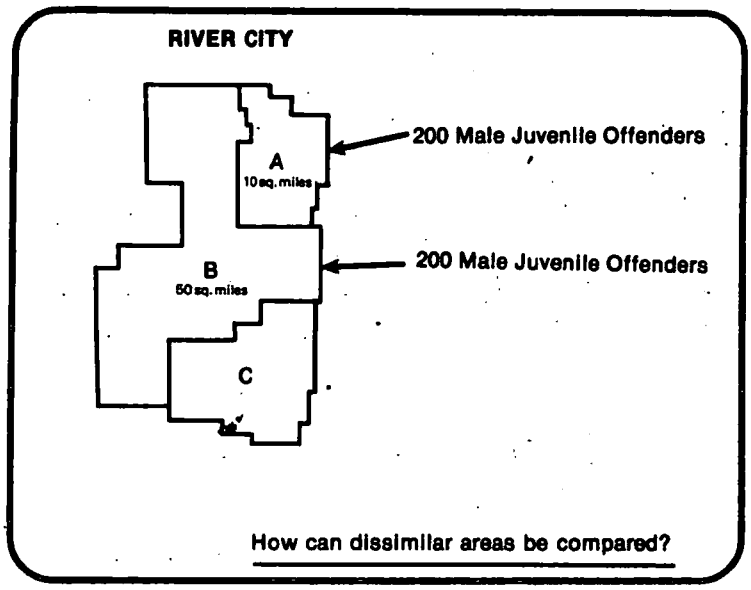
C. Four Types of Index Numbers

1. Density Index

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

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

SHOW V.A. (4-1):



EMPHASIZE (4-1):

+ The density index enables dissimilar areas to be compared.

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

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

+ Different action might be taken if the number of juveniles involved, for example 200 reside in an area of five square miles than if they resided in a fifty square mile area. It is also possible that the nature of police operations would depend on the density of risk groups (e.g., male juveniles.)

+ Another useful application is that of calculating commercial density such as liquor store robberies per square mile compared to number of liquor stores per square mile.

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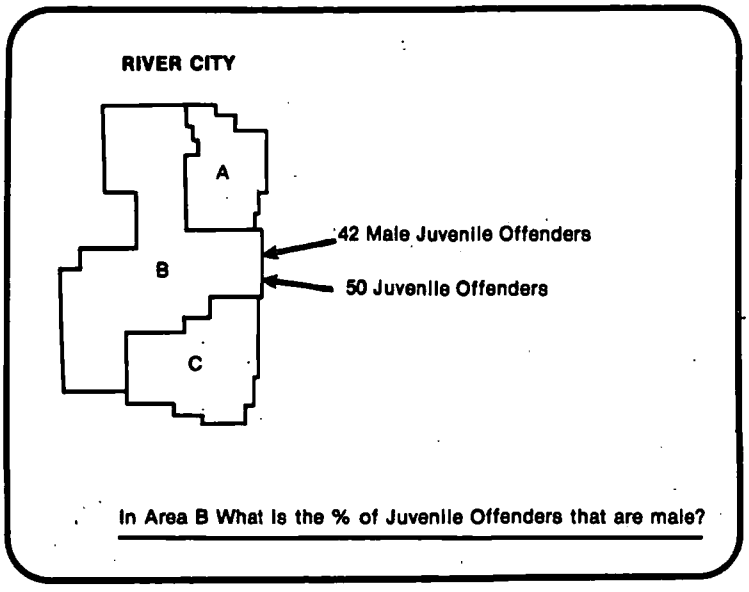
b. Density is particularly important for aggregate statistics, because it standardizes for size of area. Thus, political or administrative areas (e.g., states, counties, cities, police districts, and census tracts), can be converted to comparable units by means of a density index.

2. Concentration Index

a. Definition: A concentration index identifies what percent of a crime group (victims or offenders) has a particular crime characteristic.

$$\text{Concentration Index} = \frac{\text{Number of male Juveniles in Area B having delinquency petitions}}{\text{Total number of juveniles in Area B having delinquency petitions}}$$

SHOW V.A. (4-2):



EMPHASIZE (4-2):

+ In Area B, 84% of juvenile offenders are male.

+ This index does not deal with risk groups but with those who have already become involved in crime as offenders or victim.

+ It is perhaps, the easiest type of index to construct because all the elements come from the same data source.

+ Construction of many criminal justice programs require break-out of information on sub-groups of the victim or offender population.

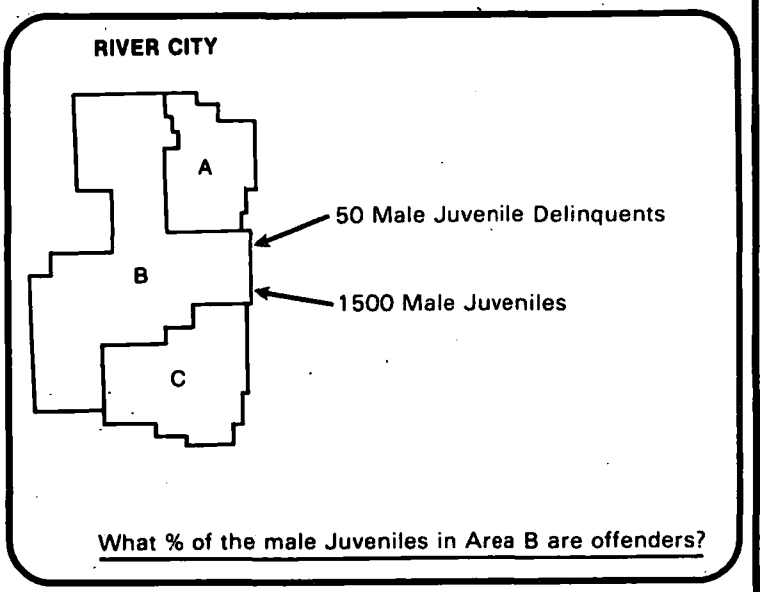
+ Example: In constructing a juvenile diversion program for a particular area it may be important to determine the percent of males and females so that programs could be designed accordingly. Or in the instance of liquor store burglaries in different regions of the city, it might be important to know what percent of the stores burglarized had a particular security system.

3. Distribution Indices.

a. Definition: A distribution index identifies what percent of the risk group reflects the crime problem.

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

SHOW V.A. (4-3):



EMPHASIZE (4-3):

+ Three percent of the male juveniles in Area B have been adjudged delinquent?

+ Two data sets are required as the number of delinquents could not be extracted from a census of male juveniles.

+ The appropriate risk group in this instance would be male juveniles.

+ Other risk groups other than juveniles could be studied, such as places-(liquor stores) or things-(autos).

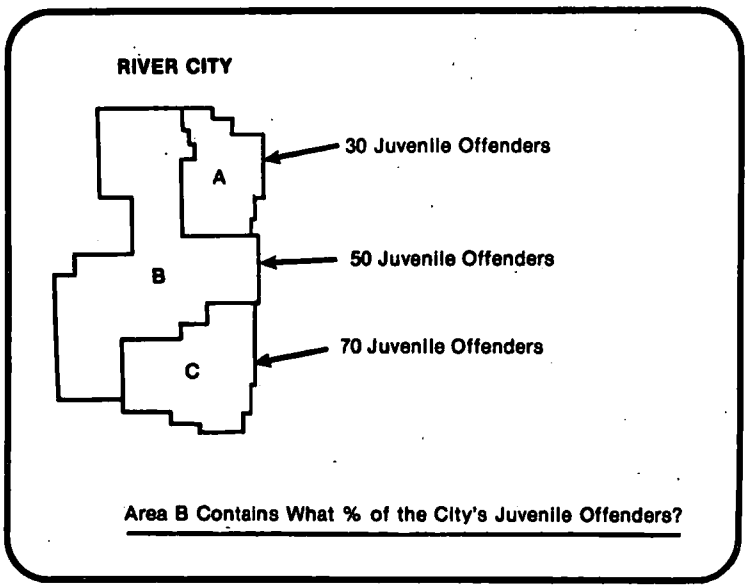
b. This kind of measure is often useful for resource allocation and/or long-range planning.

4. Index of Unit Share.

a. Definition: The index of unit share indicates what percent of the total region's crime problem occurs in a given sub-section.

$$\text{Index of Unit Share} = \frac{\text{Number of Delinquent Juveniles in Area B}}{\text{Number of Delinquent Juveniles in Chaos City}}$$

SHOW V.A. (4-4):



EMPHASIZE (4-4):

+ Area B contains 33 percent of the City's juvenile offenders?

+ 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.

---

5. Each of the four types of index numbers may be displayed pictorially as we have just seen. Usually, each geographic area is detailed in a particular density of shading which corresponds to the index value. Such pictorial presentations can be easily and quickly understood, thus are excellent tools in communication with decision-makers.

D. 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 simple 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 Table I and interpret the table by identifying extreme patterns. What are the strengths/weaknesses of this approach?

INSTRUCTOR NOTES

A. Explain Table I 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.

D. Ten Minutes are alloted for this Walk-Through.

E. When most of the participants have completed the Walk-Through, reconvene the class and review the debriefing points.

DEBRIEFING NOTES

A. Table I 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.

WALK-THROUGH 'F'

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	1,333.9	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	9	8	14	17	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	8
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	949.2	1,895.5	10	10	10	9	20	19	8	9

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, by Michael R. Gottfredson (and others). Washington, D.C.: USGPO, 1978.

WALK-THROUGH 'F'

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 reasons:

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

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. A scale is needed that reflects public sentiment about which crimes are serious and which are not.

B. An example of a Seriousness Scale: 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.

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.

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, in the case of a juvenile who steals $50, the seriousness of the crime is assessed as a larceny with a score of 2 using the Sellin-Wolfgang Scale. In a second example, in which 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
```

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.

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 1973-1977.
4. Compare it to percent change in incident and rate.
5. Describe trends in assault between 1973 and 1977 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. When most of the participants have completed the exercise, reconvene the class and review the debriefing notes.

D. Exercise Schedule

Briefing	- 5 minutes
Participant Activities	- 30 minutes
Debriefing	- 10 minutes

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.

EXERCISE #2

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.

EXERCISE #2

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
$\sum$	1015	3553	1251	4665	1424	6284	1410	6825	1331	6251

* SS= Seriousness Score

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

EXERCISE #2

III. CROSS CLASSIFICATION TABLES

A. The purpose of cross-classification is to begin the 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 .

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 reported 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 reported 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 might be at work. For example, the same number of burglaries are reported in other cities as in rural areas, and considerably more murders and forcible rapes are reported 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	

Source: United States, National Criminal Justice Information and Statistics Service. Sourcebook of Criminal Justice Statistics, 1977, by Michael R. Gottfredson, et al. Washington, D. C.: USGPO, 1978.

C. Percentaging a Cross Classification

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

2. 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.

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

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

WALK-THROUGH 'G'

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.

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

D. When most of the participants have completed the Walk-Through, reconvene the class and review the debriefing.

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

WALK-THROUGH 'G'

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		Total
	Unemployed %	Employed %	%
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		Total
	Unemployed %	Employed %	%
Recidivist	60.0	14.0	33.3
Non-Recidivist	40.0	86.0	67.7
Total	100.0	100.0	100.0

DEBRIEFING NOTES

1. Categories are set up according to the hypothesis, e.g. employment status of ex-offenders is related to recidivism.
2. Each category is unique, e.g. either employed or unemployed.
3. Percentages are easier to interpret than raw frequencies.
4. Percentages should be computed in relation to the believed cause and effect specified in the theory: that is employment status influences recidivisms not recidivism influences employment status.

WALK-THROUGH 'G'

NOTES

IV. SCATTERGRAMS

A. Definition: A scattergram is a graphical presentation of interval level data.

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

2. The convention for Scattergram construction is to place the dependent variable on the vertical (Y) axis and the independent variable on the horizontal (X) axis.

B. Construction and Interpretation of Scattergrams.

1. Examples of Scattergrams and their interpretation are presented in Walk-Through H.

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.

DEBRIEFING NOTES

1. Regardless of the extent of analysis, whether by methods of simple description or by inferential techniques, two-variable data should be plotted before analysis. Knowing the plot of the data helps in selection of appropriate statistical tools.

2. The plot of data is also the last step of analysis, that is, the information of analysis is more easily conveyed when accompanied by a plot.

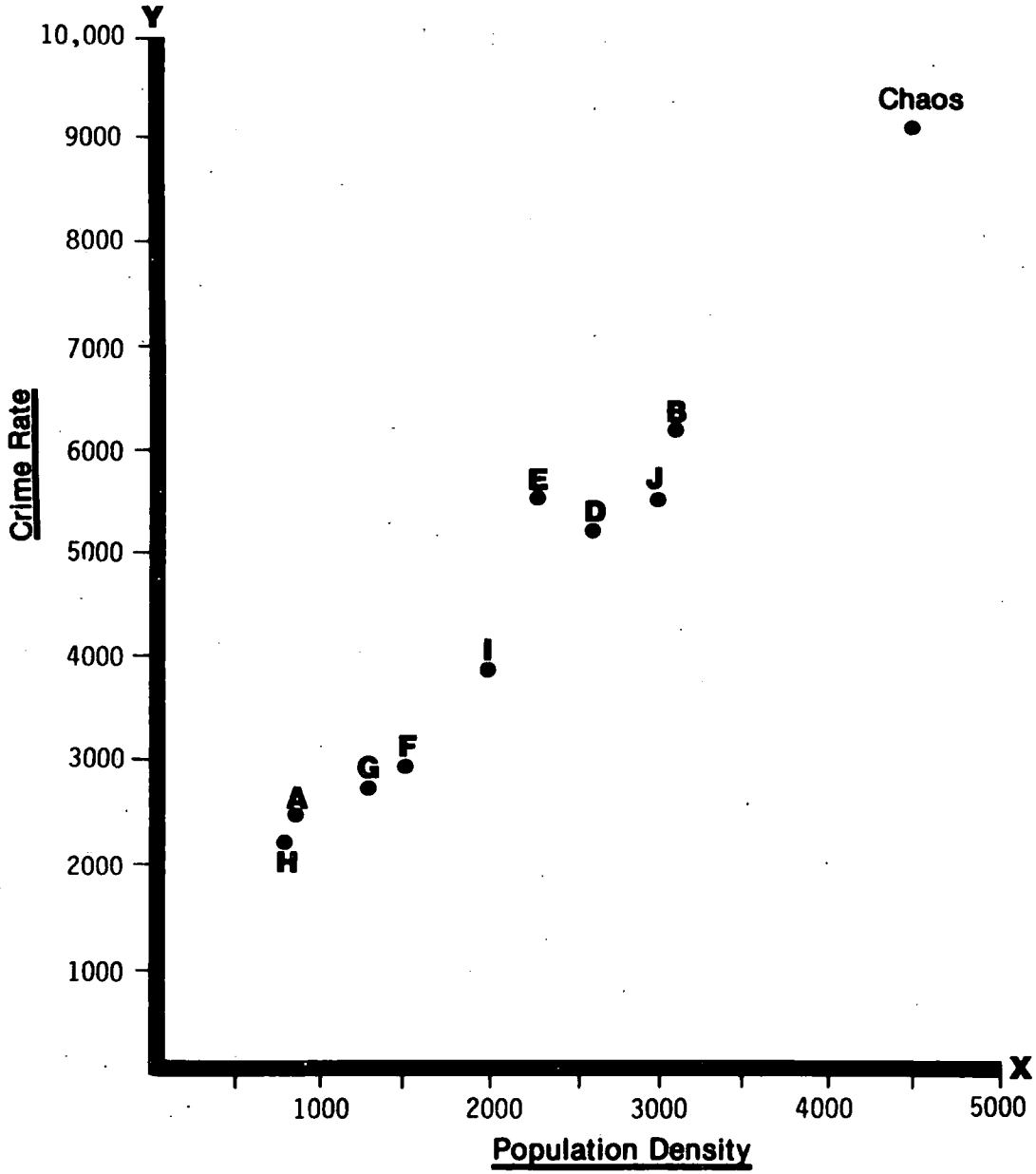


Table 1.

Crime Rate Related to Population Density

LEGEND:

Cities	Population Density*	Crime Rate
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

* $\frac{\text{Total Population}}{\text{Area (in sq. miles)}}$

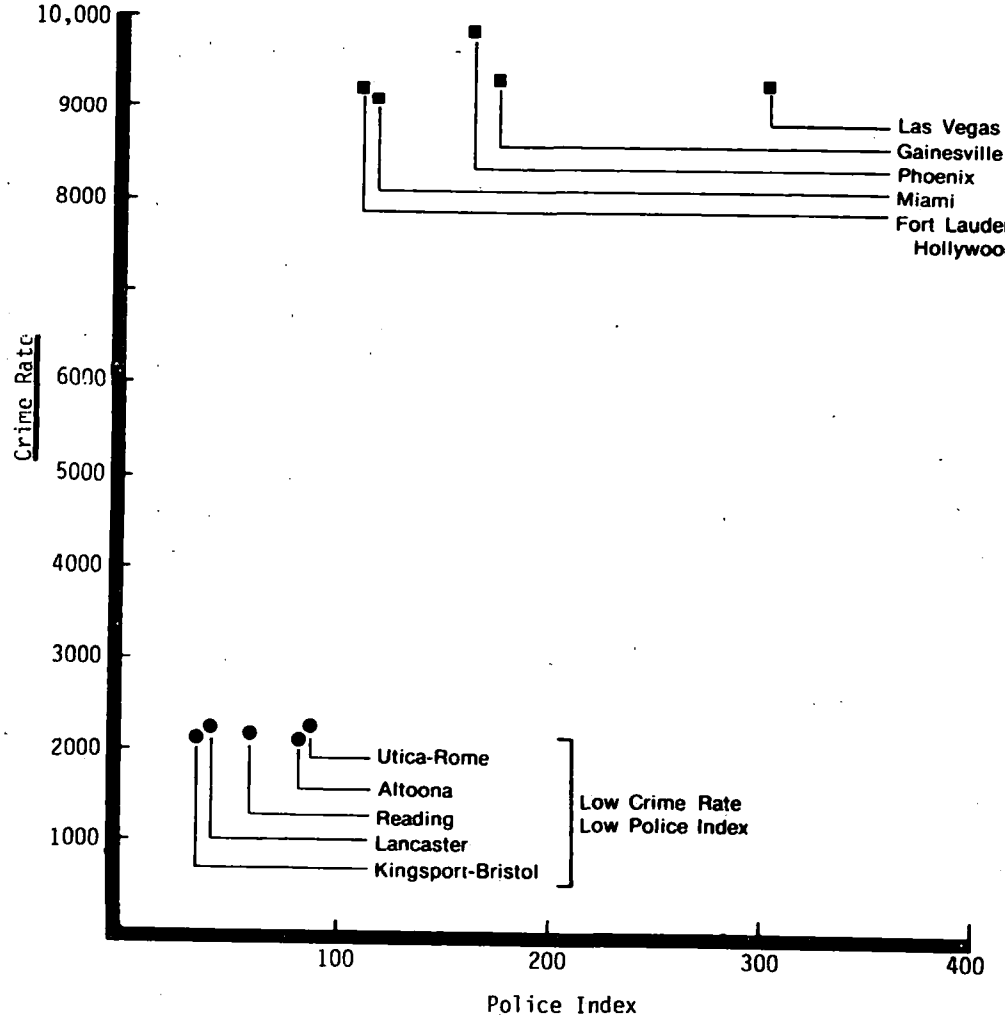
** Total Crime Index per 100,000 Population

Source: Hypothetical Data

WALK-THROUGH 'H'

Table 2.

Total Crime Index
Related to Police Strength



LEGEND:

Low SMSA's	Police Index *	Crime Rate **
Altoona, Pa	82.7	2112
Kingsport-Bristol, Tenn.	34.7	2159
Lancaster, Pa.	38.8	2244
Reading, Pa.	64	2167
Utica-Rome, N.Y.	85.3	2192
High SMSA's		
Phoenix, Ar.	162.0	9795
Miami, Fla.	117.0	9130
Las Vegas, Nev.	300.2	9318
Gainesville, Fla.	170.3	9328
Fort Lauderdale-Hollywood, Fla.	108.7	9252

* Officers/100,000 population

** Total Crime Index per 100,000 Population

Source: Sourcebook, 1976

WALK-THROUGH 'H'

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.

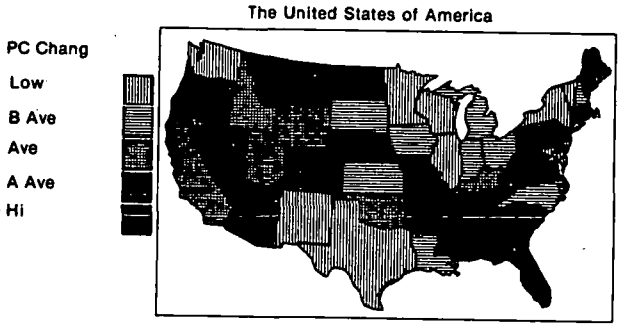
B. Principles in Map Making

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):

Percent Change in Corrections Expenditures 1971-1974



Source for Data: U.S. Depts. of Justice and Commerce, Trends in Expenditure and Employment Data for the Criminal Justice System, 1971 - 1976, 1978.

Source for Mapping Technique: Univ. of Michigan, Multipurpose Integrated Data Analysis Software, 1977.

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:

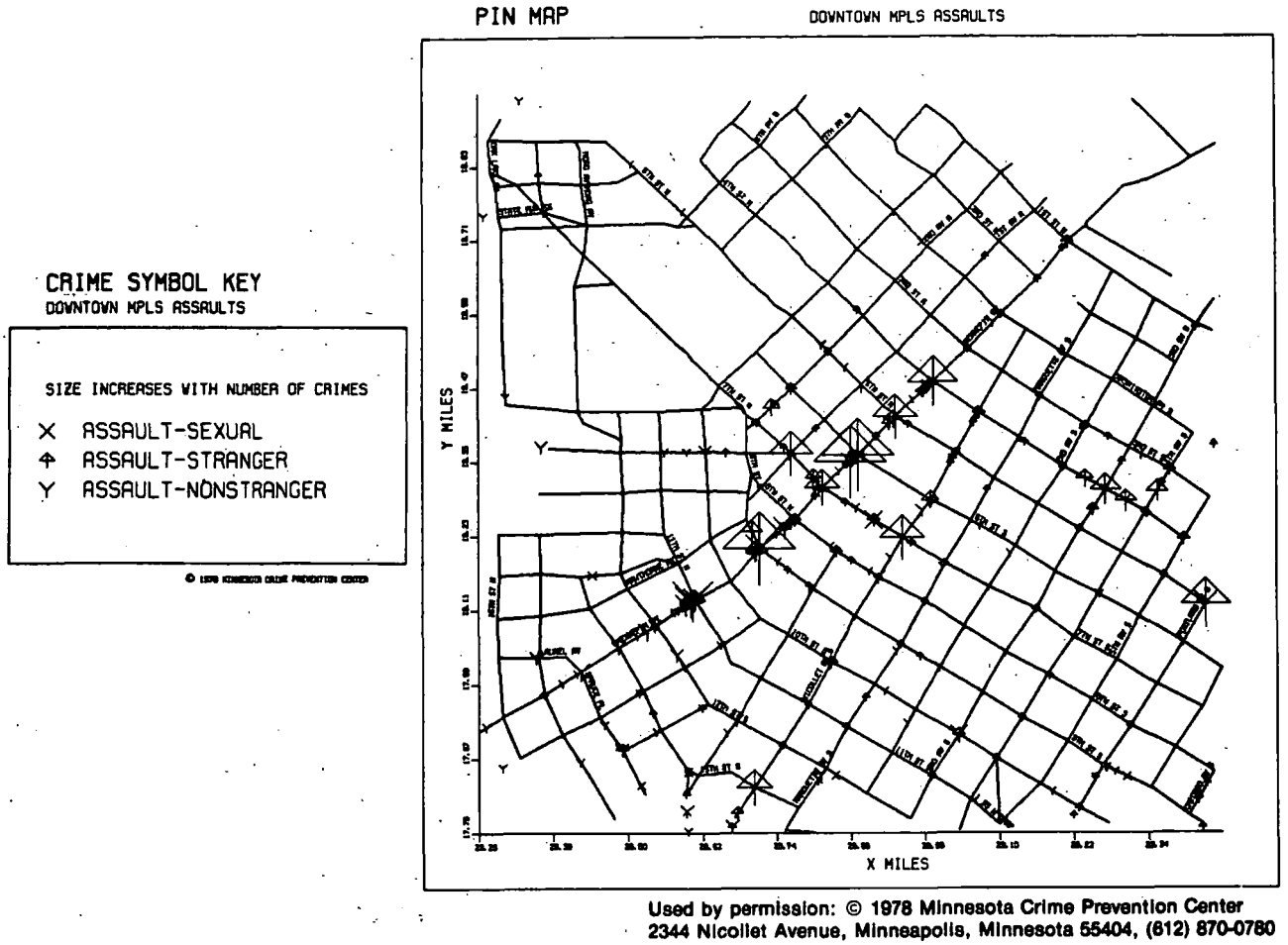
  High = 72% + (Maximum is 172.6%)
  High Average = 51 to 71%
  Average = 43 to 50%
  Low Average = 31 to 42%
  Low = 30% (Minimum is -12.5%)

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

C. Spatial characteristics of crime

1. 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):

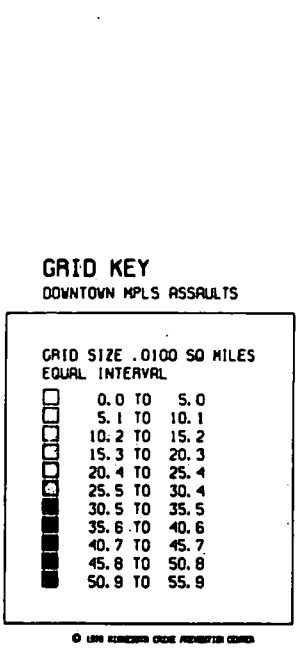


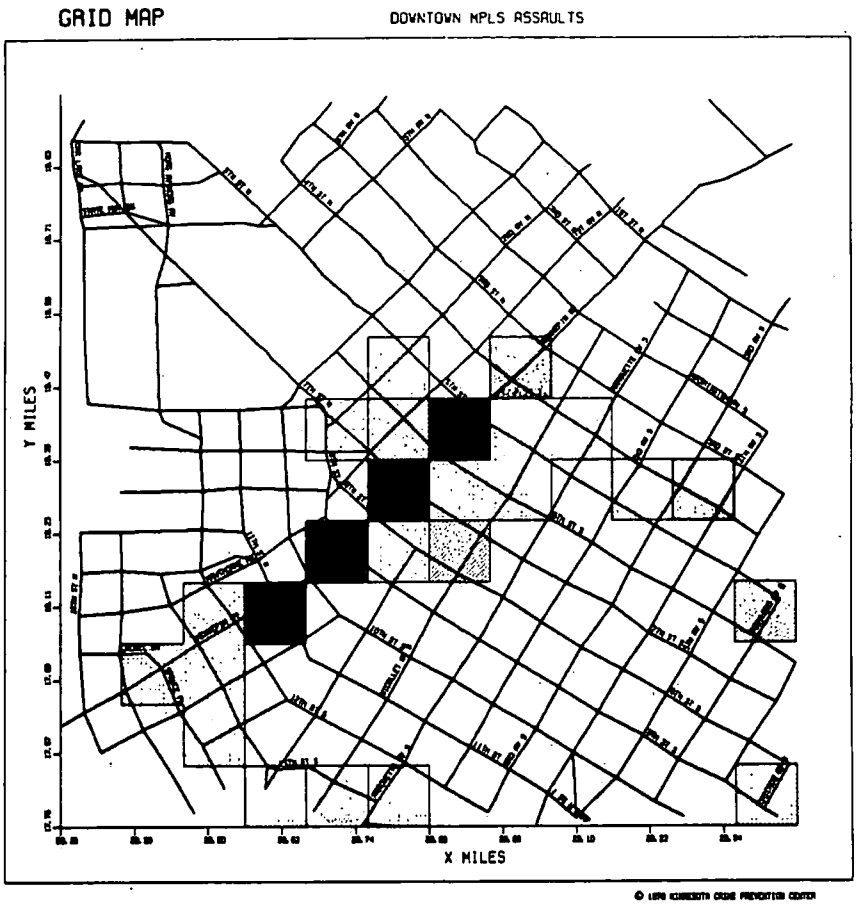
Used by permission: © 1978 Minnesota Crime Prevention Center
2344 Nicollet Avenue, Minneapolis, Minnesota 55404, (612) 870-0780

EMPHASIZE (4-6):

+ Map of downtown Minneapolis indicating the geographic pattern of three 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):





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):

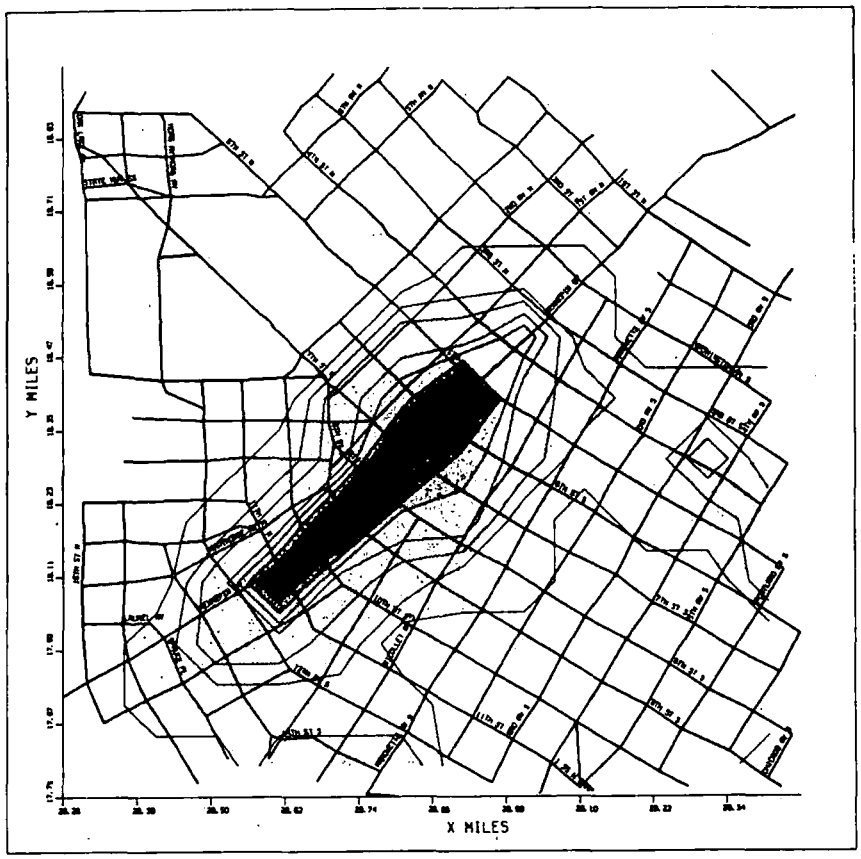
SMOOTHED CONTOUR KEY
DOWNTOWN MPLS ASSAULTS

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

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SMOOTHED CONTOUR MAP DOWNTOWN MPLS ASSAULTS



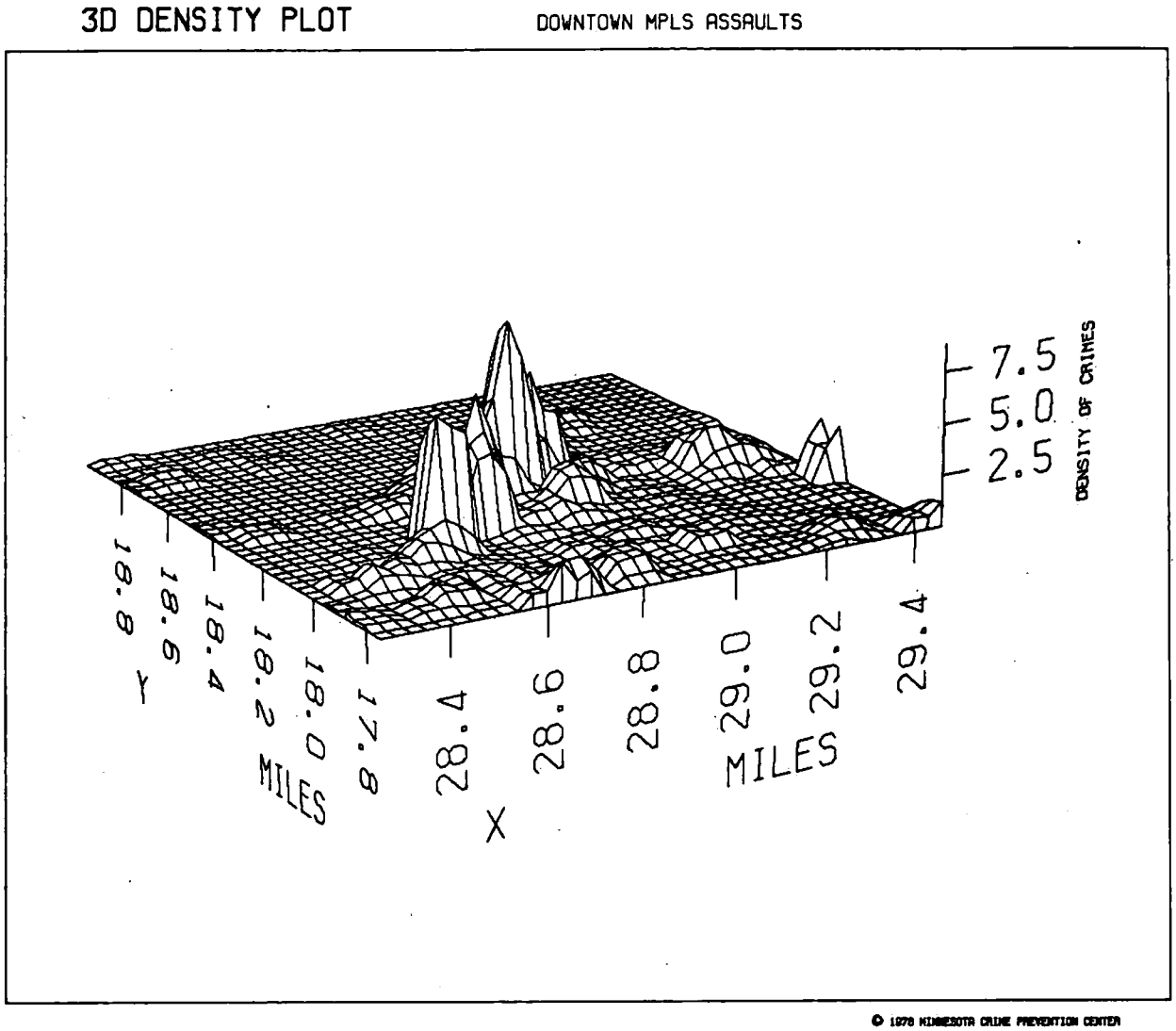
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EMPHASIZE (4-8):

+ 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):

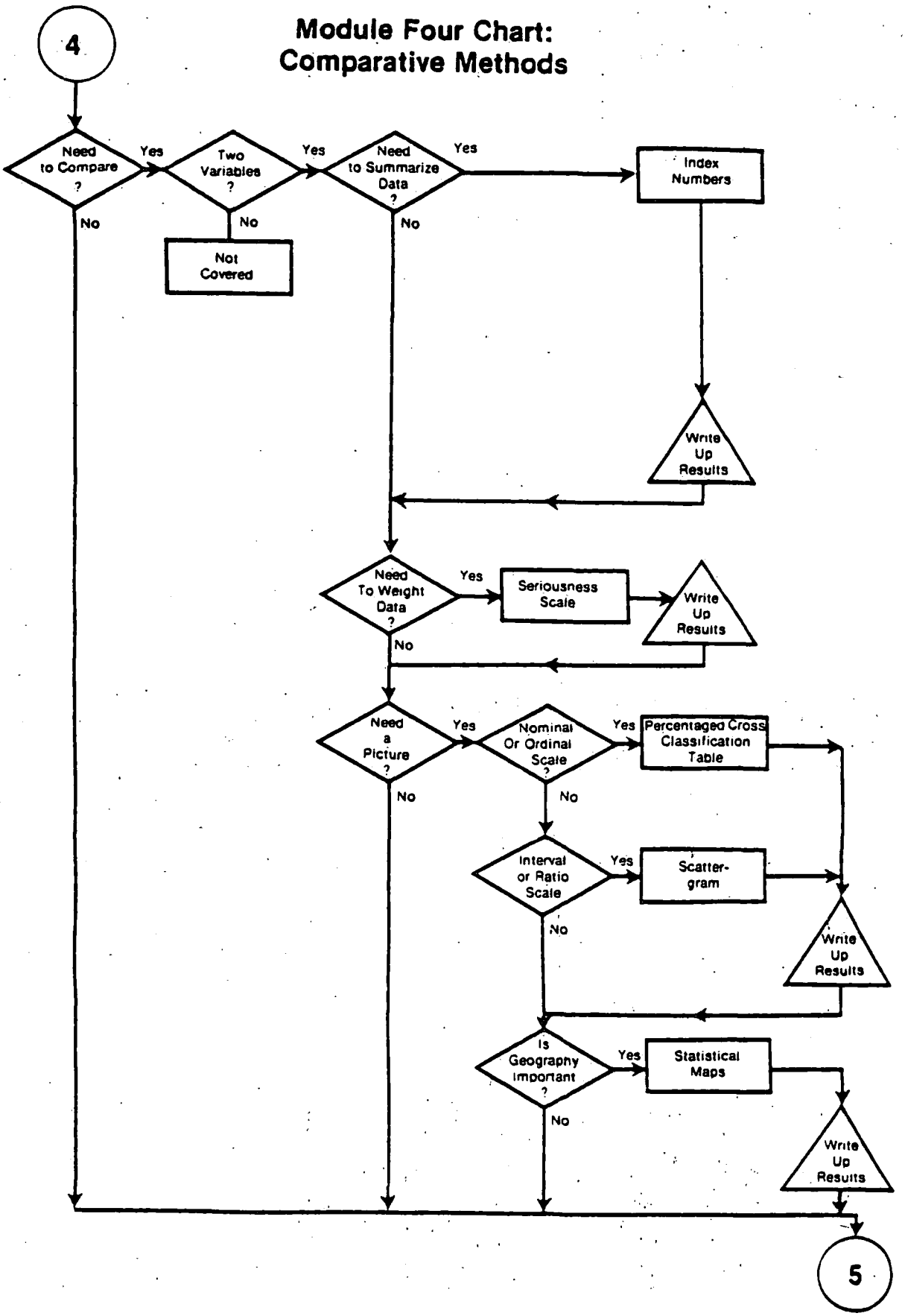
+ Three dimensional contour map of assault densities in downtown Minneapolis.

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

VI. CONCLUSION

A. 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.

SHOW V.A. (4-10):


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

1. To explain the purpose and outline the general process of statistical testing.

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

   a. Chi square statistic

   b. Correlation coefficient

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

   a. Visual estimation

   b. Least squares regression

SCHEDULE

INFERENTIAL METHODS

TIME ALLOCATION

TOPIC	TIME	PAGE
I. STATISTICAL TESTING	30 minutes	V-3
A. Definition	10 minutes	V-3
B. Statistical Tests	20 minutes	V-4
II. CHI SQUARE TEST OF INDEPENDENCE	60 minutes	V-7
A. Uses	*	V-7
B. Characteristics	*	V-7
Walk-Through 'I' CHI SQUARE	10 minutes	V-10
Exercise #3 CHI SQUARE	50 minutes	V-13
III. CORRELATION COEFFICIENT	60 minutes	V-18
A. Uses	*	V-18
B. Characteristics	*	V-18
C. Calculating r	10 minutes	V-19
D. Testing Significance of r	*	V-20
E. Limitation	*	V-20
Walk-Through 'J' CORRELATION COEFFICIENT	10 minutes	V-21
Exercise #4 CORRELATION COEFFICIENT	40 minutes	V-25
IV. REGRESSION	60 minutes	V-31
A. Time Series Data	*	V-31
B. Visual Estimate of Regression Line	5 minutes	V-34
C. Least Squares Regression	20 minutes	V-37
Exercise #5 REGRESSION	35 minutes	V-40
V. INTERPRETATION OF FINDINGS	60 minutes	V-47
A. Purpose	*	V-47
B. Examples	*	V-47
Exercise #6 INTERPRETATION OF FINDINGS	60 minutes	V-48
VI. CONCLUSION	10 minutes	V-65
TOTAL TIME	280 minutes	

* Less than 5 minutes

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?

(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

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.

+ 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.

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) $$\chi^2 = \sum \frac{(O - E)^2}{E}$$

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

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

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

O = Not freely specified

	√	√	√	√	√	0	RT1
	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,CT_1) (RT_1,CT_2) (RT_1,CT_3) (RT_1,CT_4) and (RT_1,CT_5) 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
(χ^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.

CHI SQUARE

PURPOSE

This problem examines the association between responses to a survey question, "What level of regard do you hold for Police?" 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_0: Response is independent of race.
2. State the alternative hypotheses, H_a: Response and race are related.
3. Calculate expected values, substitute in formula.
4. Establish rejection region at .05. Calculate degrees of freedom.
5. What are your conclusions about H_0 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 10 minutes.

WALK-THROUGH 'I'

DATA SET

Table 1. Race of Respondent and Regard for Police

	RACE		Totals
	White	Black	
High Regard for Police	80	25	105
Low Regard for Police	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
					Σ = 17.68

D. $\Sigma((O-E)^2/E) = \chi^2 = 17.68$

E. Determine Degrees of Freedom = (r-1)(c-1) = 1
Establish Rejection Region at .05

F. Compare calculated and Table χ^2; interpret result.

Table χ^2 = 3.84; Calculated χ^2 = 17.68

G. Conclusions: H_o: response is independent of race (rejected)
H_a: response and race are related (accepted)

SHOW V.A. (5-4) AGAIN

VALUES OF CHI SQUARE
(χ^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.

WALK-THROUGH 'I'

CHI SQUARE

EXERCISE #3

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.

A. You will be assigned one of the hypotheses in the Worksheets (Part I or Part II) to evaluate. The hypothesis in Part I of the Worksheet may be stated as: crime trend is independent of type of geographic area. The hypothesis in Part II is: attitude toward burglary is independent of residential location.

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 χ^2 statistics.

F. State your decision about H_0 and H_a, based on the χ^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. When most of the participants have completed the exercise, reconvene the class and review the debriefing notes.

E. Schedule

1. Preparation - 5 minutes
2. Activities - 35 minutes
3. Debriefing - 10 minutes

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 #3

WORKSHEET

A. Part One:

1. State Null and Alternative 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. $\Sigma((O-E)^2/E) = \chi^2 = 101.07$

5. Determine Degrees of Freedom = $(r-1)(c-1) = 2$
Establish Rejection Region at .05

6. Compare calculated and Table χ^2; interpret result.

Table $\chi^2 = 5.99$

Calculated $\chi^2 = 101.07$

EXERCISE #3

WORKSHEET (Continued)

B. Part Two:

1. State Null and Alternative 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. $\Sigma((O-E)^2/E) = \chi^2 = 285.50$

5. Determine Degrees of Freedom = $(r-1)(c-1) = 4$
Establish Rejection Region at .05.

6. Compare calculated and Table χ^2; interpret result.

Table $\chi^2 = 9.49$

Calculated $\chi^2 = 285.49$

EXERCISE #3

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.

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.

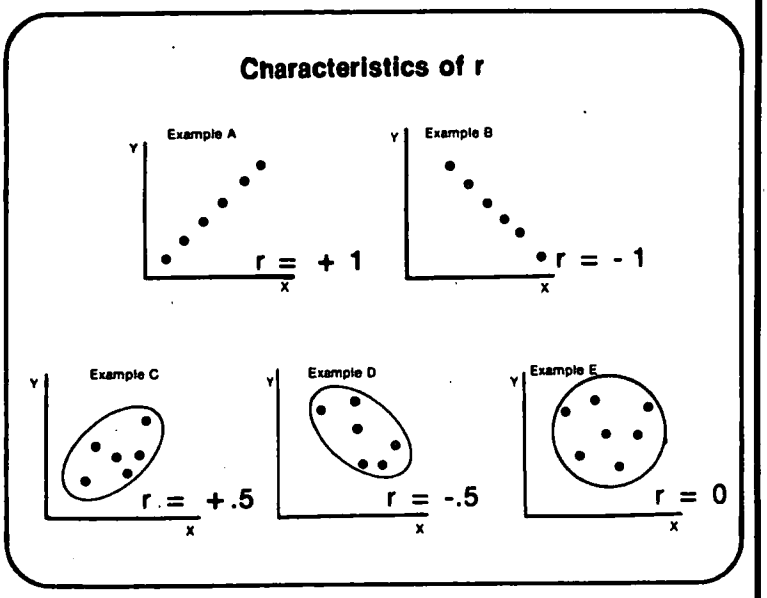
2. Indicates the nature of strength of a relationship between two variables.

3. Reflects the shape of a distribution.

4. Correlation coefficient helps to interpret scattergrams.

B. Characteristics

SHOW V.A. (5-5):



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

d.f.*	Level of Significance .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. Ames, Iowa: Iowa State University Press, 1974, p. 557.

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 and n-2 degrees of freedom, the null hypothesis may be rejected.

E. Limitation:

1. While r determines the strength of the relationship between two variables, it does not establish causality.

2. The variables may be related to a third intervening variable that causes the observed relationship.

3. Relationships demonstrated using r may only be used to disprove a theory.

4. Causality is explained by theory used in problem specification.

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 plot the data and 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.

WALK-THROUGH 'J'

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.

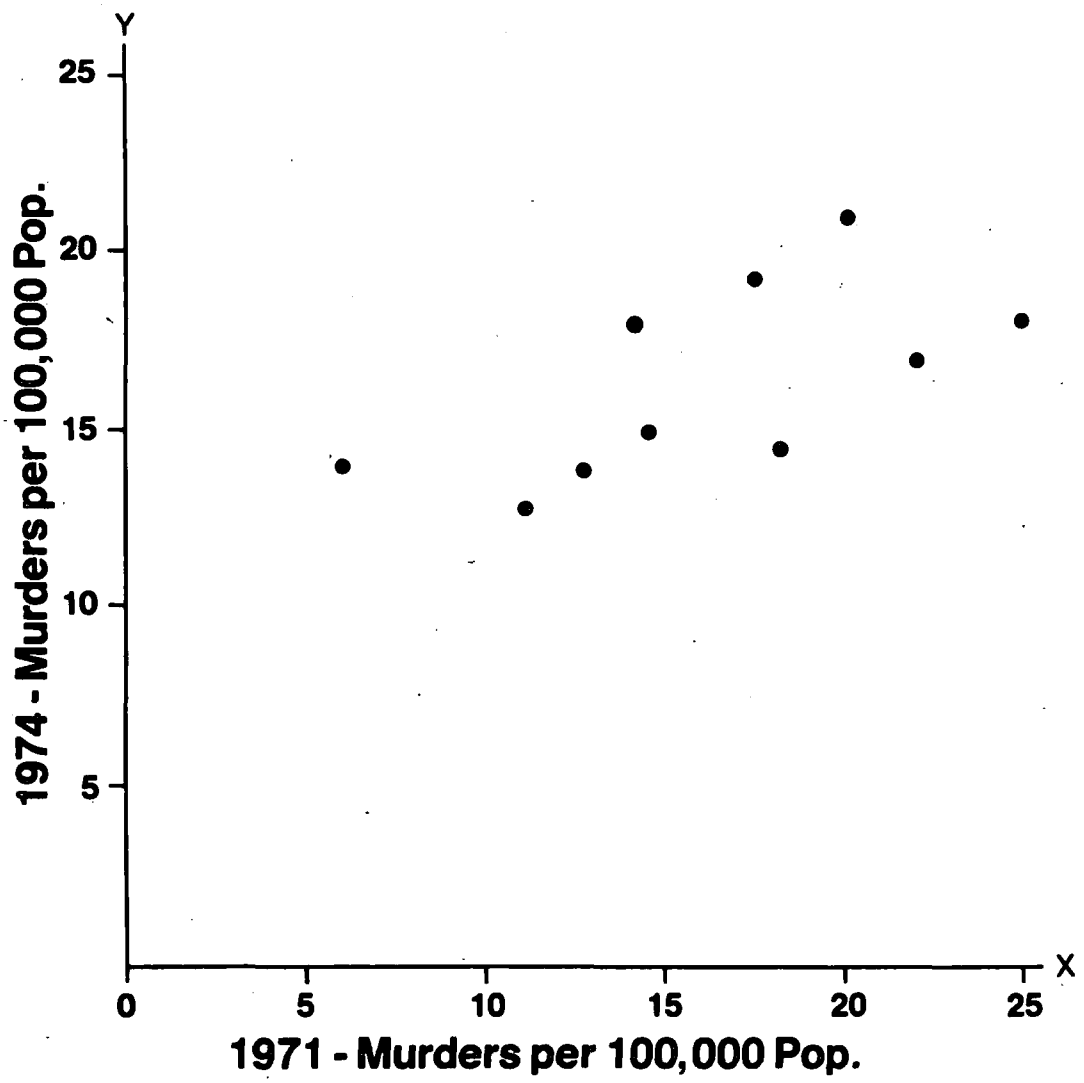
Sources: Sourcebook, 1976; also, Mendenhall, Ott and Larson. Statistics for the Social Sciences, 1975.

WALK-THROUGH 'J'

WORKSHEET

A. Plot the data:

MURDER RATES FOR TEN CITIES, 1971 & 1974



Source: Sourcebook, 1976

WALK-THROUGH 'J'

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
$\sum$	161	164	2723	2869	2750

2. $(\Sigma X)^2 = 25921$

$(\Sigma Y)^2 = 26896$

3. $$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}\sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$$

$$r = \frac{10\,(2723) - (161)(164)}{\sqrt{10(2869) - (161)^2}\sqrt{10(2750) - (164)^2}}$$

$r = .639$

4. Table r = .632 (d.f. = n-2 = 8, $\alpha = .05$)

WALK-THROUGH 'J'

CORRELATION COEFFICIENT

PURPOSE

To give the participants an opportunity to calculate and interpret a correlation coefficient.

INSTRUCTIONS

A. Prepare a scattergram.

B. Calculate and interpret the correlation coefficient between population density and larceny offenses for 13 counties in Florida.

C. Determine the significance of r (refer to the V.A. 5-7 for critical values of r).

INSTRUCTOR NOTES

A. Have participants prepare a scattergram using the graph paper provided in the participant guide prior to calculation of the correlation coefficient. A copy of the completed scattergram is provided in the Instructor Guide.

B. Have participants calculate the correlation coefficient.

C. 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.

D. Have them interpret their results.

E. When most of the participants have completed the exercise, reconvene the class and review the debriefing notes.

F. Schedule:

1. Preparation - 5 min.
2. Activity - 25 min.
3. Debriefing - 10 min.

EXERCISE #4

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

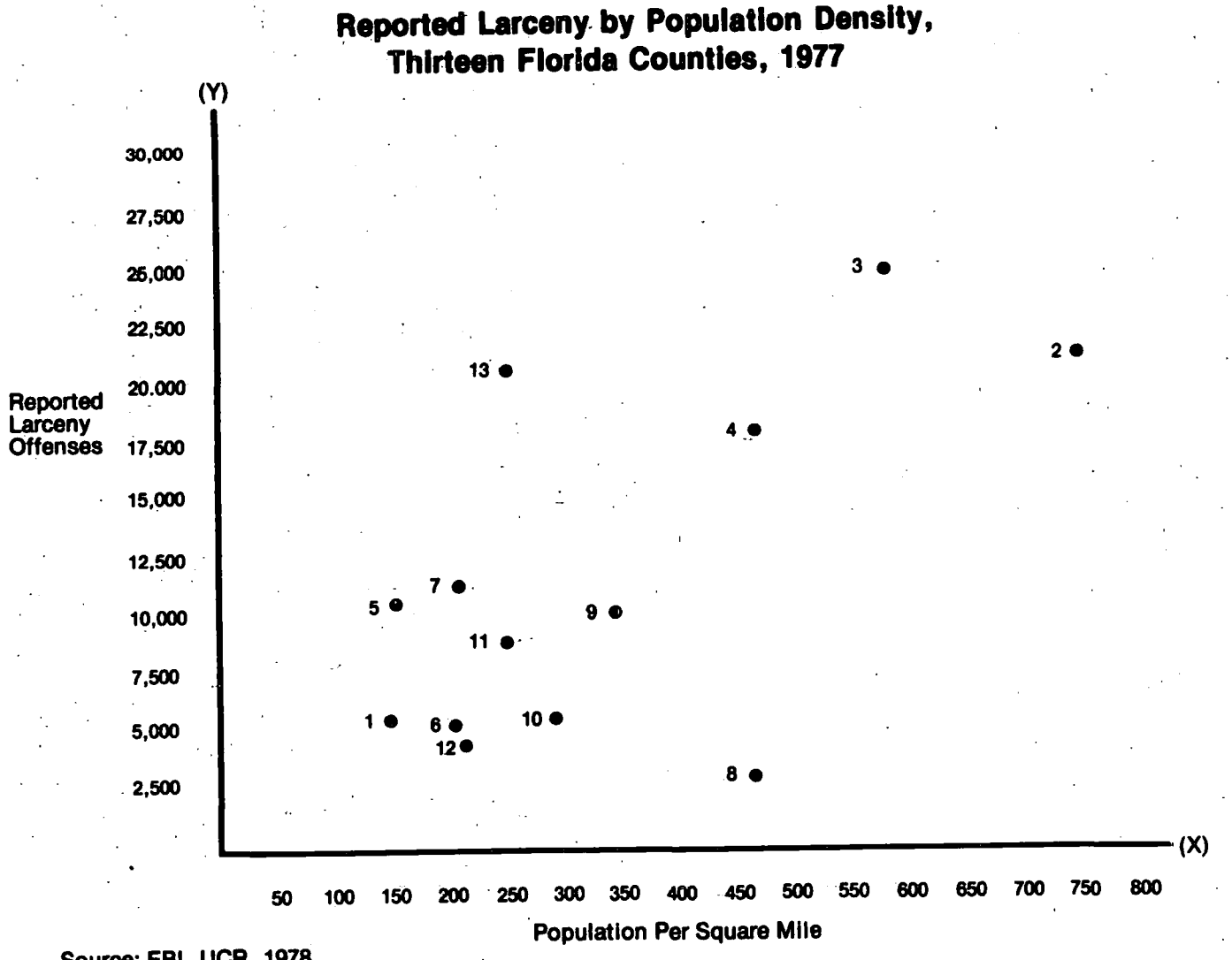
Source: FBI, UCR, 1978

EXERCISE #4

WORKSHEET

A. Prepare a scattergram.

SHOW ANSWER



Source: FBI, UCR, 1978

EXERCISE #4

WORKSHEET

B. 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
$\sum$	4,325	1,519	602,075	1,837,777	241,715

EXERCISE #4

C. Substitute in formula

$$r = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{N(\Sigma X^2) - (\Sigma X)^2}\sqrt{N(\Sigma Y^2) - (\Sigma Y)^2}}$$

$$r = \frac{13\ (602{,}075) - (4325)(1519)}{\sqrt{13\ (1{,}837{,}777) - (4325)^2}\sqrt{13\ (241{,}715) - (1519)^2}}$$

$$= \frac{1257300}{\sqrt{5185476}\sqrt{834934}}$$

$$= \frac{1257300}{(2277.164)(913.747)}$$

$$= .60$$

D. Test Significance (d.f. = n-2 = 11, $\alpha = .05$, $r = .553$)

$r_{.60} > r_{.553}$ = Significant relationship between reported larceny offenses and population per square mile.

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.

C. The third step is to calculate the correlation coefficient, r = .60. This is calculated with Y expressed in hundreds.

D. According to Table for Critical Values of r for $\alpha = .05$ with d.f.=11, the r value is .553. 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.

EXERCISE #4

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 should have two variables that are at least interval level.

2. Assumes a linear relationship.

3. Does not prove causality; only theory--not statistics--suggests proof, statistics indicate evidence.

4. Larger the sample size, the more powerful r is.

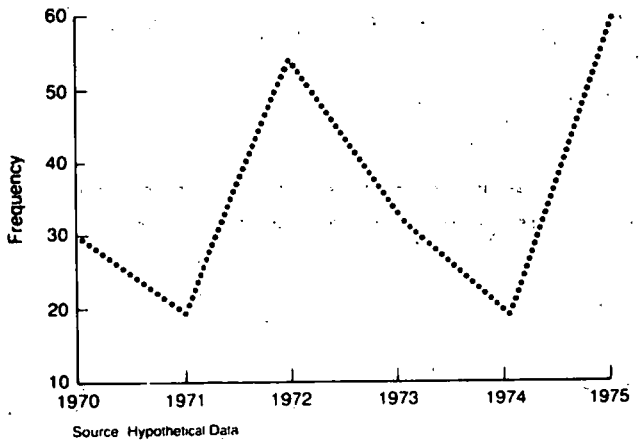
EXERCISE #4

IV. REGRESSION

A. Time Series Data

SHOW V.A. (5-8):

HOMICIDE: FIVE-YEAR TREND FOR CHAOS CITY, 1970–1975



Source Hypothetical Data

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.

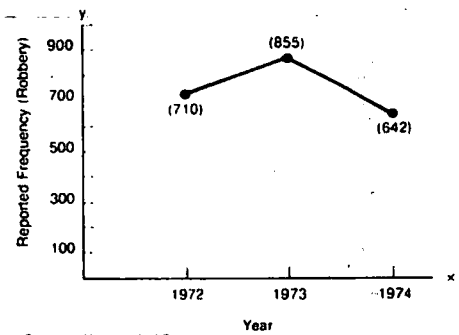
+ A review of crime trends for the prior five years might disclose that the homicide rate is susceptible to large proportional changes--both increases and decreases.

+ 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):

THREE YEAR TIME SERIES OF ANNUAL ROBBERY DATA, CHAOS CITY, 1971–1974



Source: Hypothetical Data

EMPHASIZE (5-9):

+ Generally, one can make more accurate forecasts on the basis of longer time series than on the basis of shorter ones.

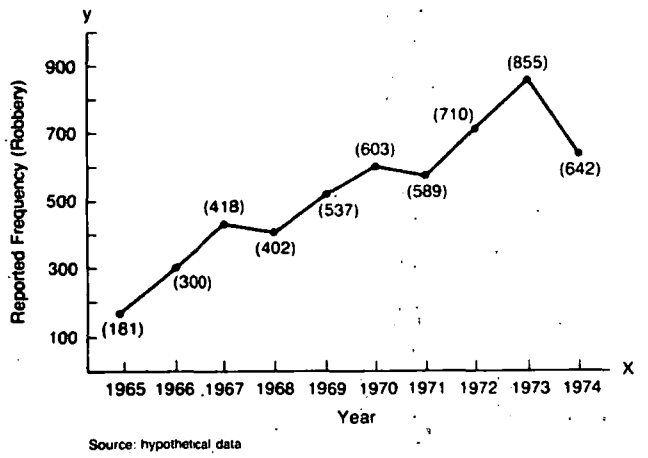
+ Shorter time series have a tendency to mask irregular (anomalous) fluctuations.

+ For example, a three-year series of annual robbery data might look like that which appears in V. A. 5-10.

2. Extended Time Series

SHOW V.A. (5-10):

TEN YEAR TIME SERIES OF ANNUAL ROBBERY DATA, CHAOS CITY, 1965–1974



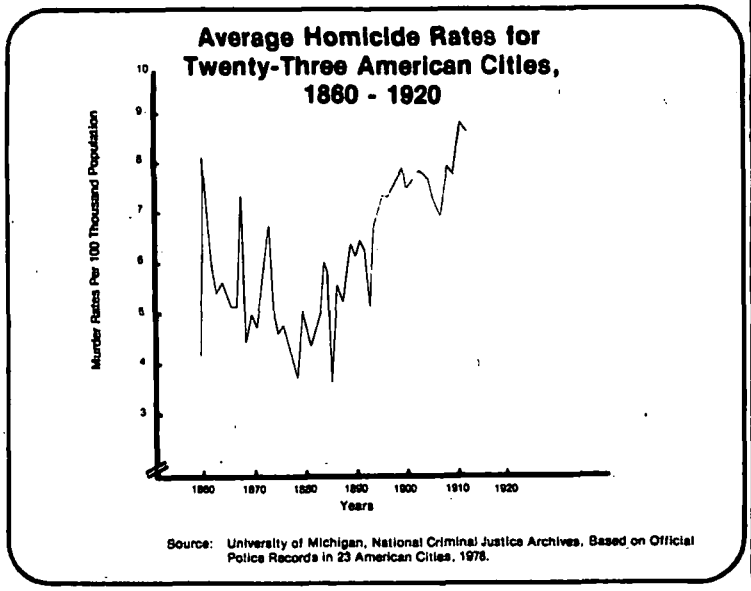
Source: hypothetical data

EMPHASIZE (5-10):

+ A longer, ten-year series may reveal a very different trend, as seen in V.A. 5-11.

+ Generally, it is advisable to use as long a time series as is available. However, length alone does not assure accuracy.

SHOW V.A. (5-11):



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.

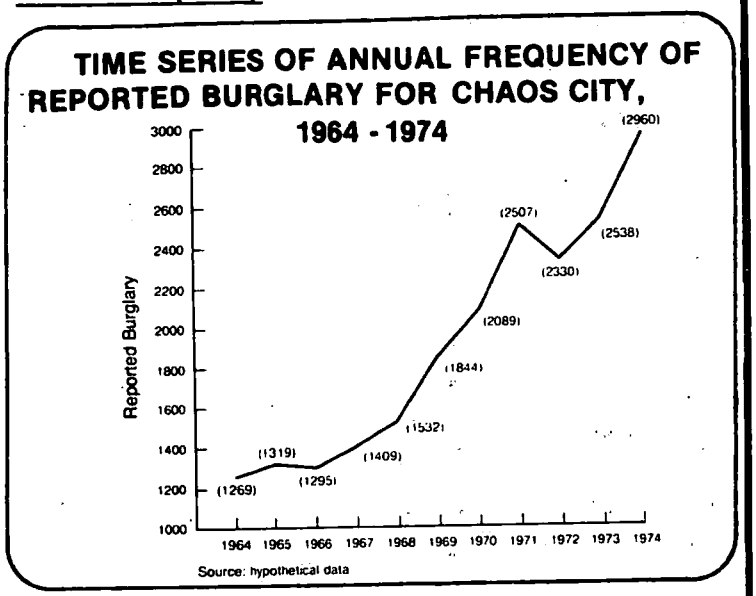
1. Procedures.

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):



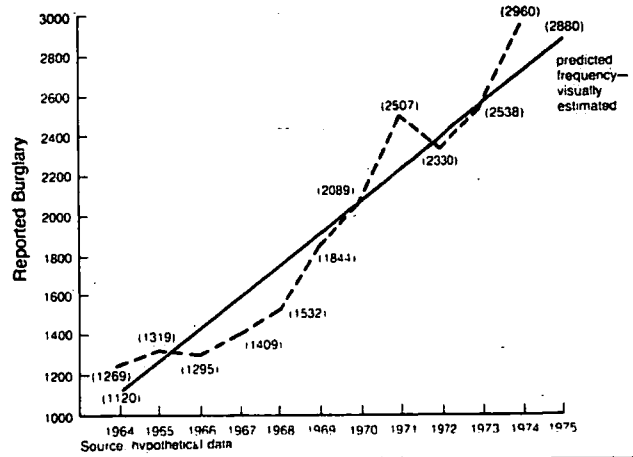
EMPHASIZE (5-12):

+ Data on reported annual incidents of burglary in Chaos City.

+ Strong indication of constant increase in incidents.

SHOW V.A. (5-13):

ANNUAL FREQUENCY OF REPORTED BURGLARY WITH VISUALLY ESTIMATED REGRESSION LINE FOR CHAOS CITY, 1964–1974



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 2880.

C. Least Squares Regression

1. Purpose

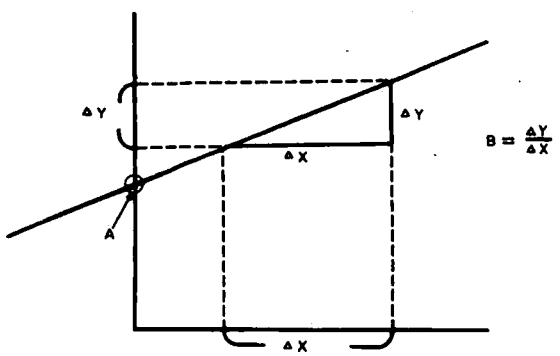
a. To aid in forecasting where there are trends in time series data.

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.

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: $$\hat{Y} = A + BX$$

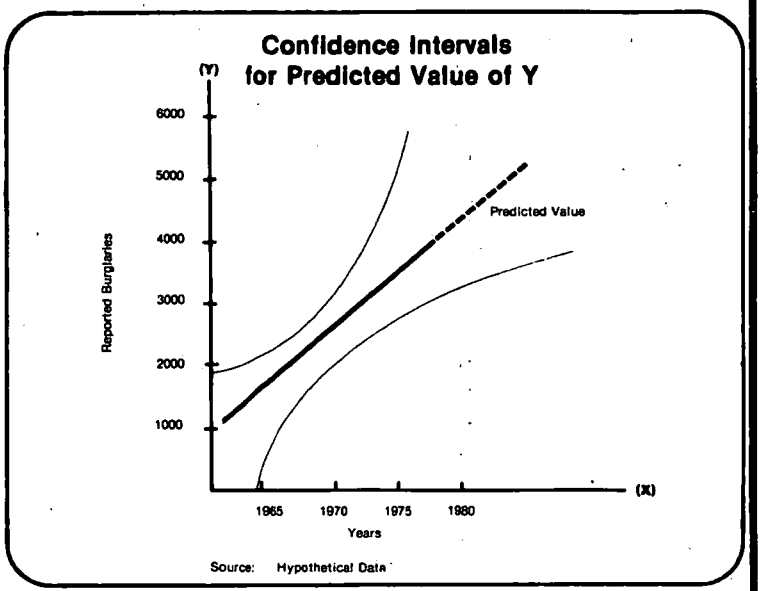
EMPHASIZE (5-15):

+ 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.

3. Assessing the Utility and Accuracy of a Least Squares Prediction

---

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. When most of the participants have completed the exercise, reconvene the class and review the debriefing notes.

C. Schedule:

1. Preparation - 5 minutes
2. Activity - 20 minutes
3. Debriefing - 10 minutes

EXERCISE #5

See page V-45-IG for the answer.

EXERCISE #5

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.

EXERCISE #5

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
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 #5

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.

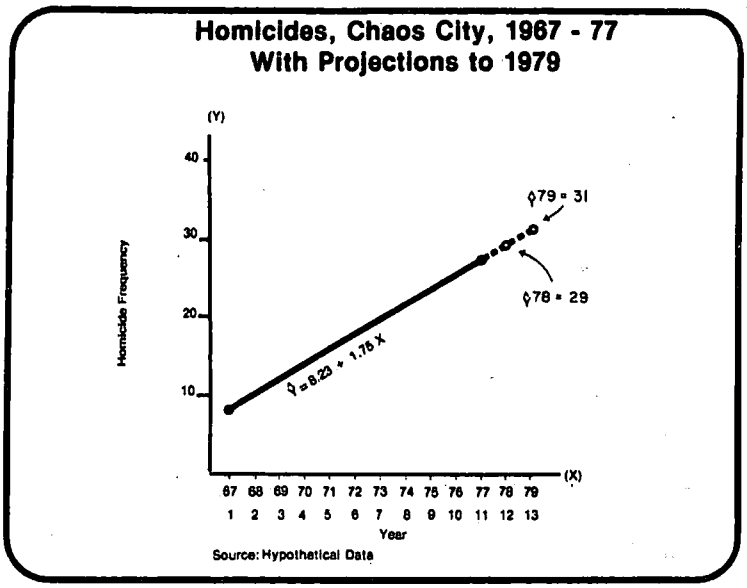
X	$\hat{Y}$
1	9.98
10	25.73

2. Now plot the line on graph paper.

EXERCISE #5

WORKSHEET Continued:

SHOW ANSWER: (Answer 5-a)



F. Estimate 1979 predicted homicide rate:

1. If 1978 = 12

   1979 = 13

2. $\hat{Y}_{78}$= 8.23 + 1.75 (12)

   $\hat{Y}_{78}$= 29 homicides

   $\hat{Y}_{79}$= 8.23 + 1.75 (13)

   $\hat{Y}_{79}$= 31 homicides

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.

E. Note the convention of redesignating the years on the horizontal axis as years 1 to 13. This redesignation facilitates calculation of the equation and inspection of the value of the Y intercept.

EXERCISE #5

V. INTERPRETATION OF FINDINGS

A. The purpose of these statistical techniques is to enable the analyst to draw conclusions about hypotheses postulated during problem specification.

B. Examples: Exercise #6 provides practice in interpreting statistics taught in Modules 3, 4, and 5.

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 is the relationship between the workload per parole officer upon the recidivism rate?
4. If existing workloads (142 cases/officers in 1977) were reduced by 20% what effect would this have on recidivism rates?
5. Is the workload of parole officers related to the incidence of technical violations by parolees?

EXERCISE #6

INSTRUCTOR NOTES

A. The exercise covers material presented in Modules 3, 4, and 5.

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 - 5 minutes

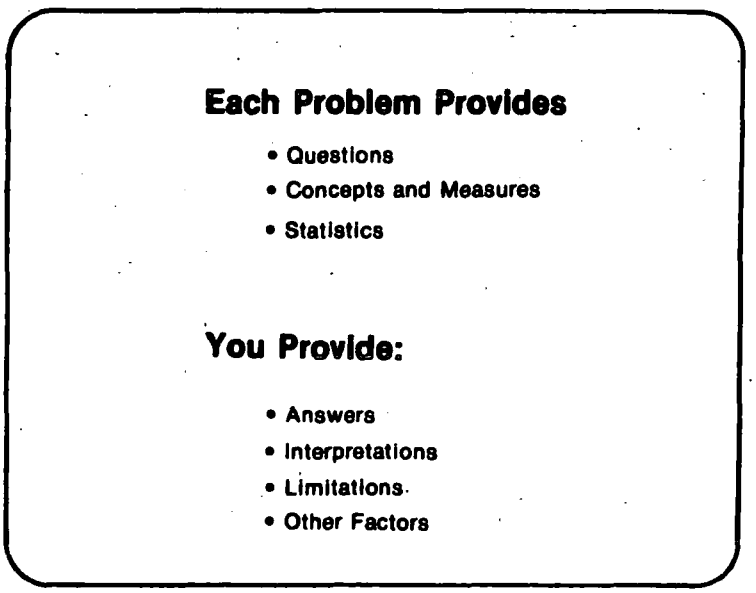
2. Activities - 35 minutes

3. Debriefing - 20 minutes

H. The first two questions may be done with participants interacting still in the class, or it may be done by each group separately.

I. When most of the participants complete the exercise, reconvene the class and review the debriefing notes.

SHOW V.A. (5-17)



EXERCISE #6

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	3266
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	137	129	143
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.

V-50-IG

EXERCISE #6

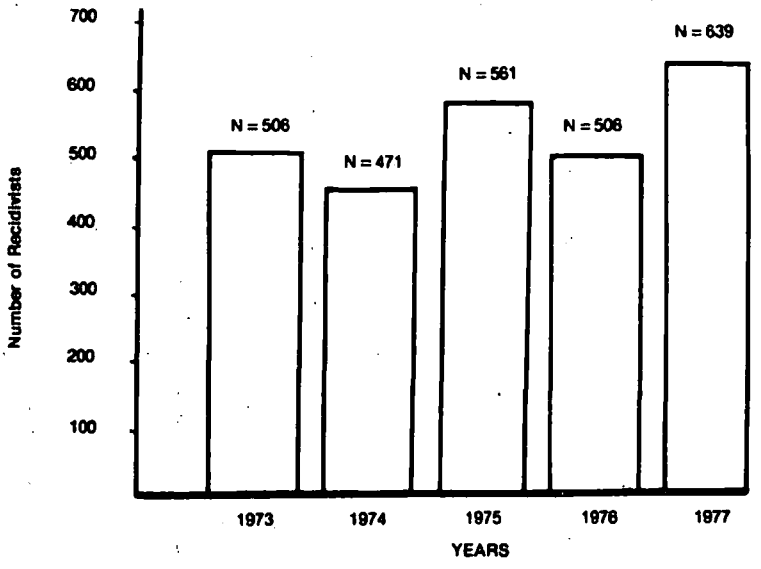
EXERCISE #6

DATA SET

QUESTION #1: Describe the trend in the number of recidivists during the past five years.

Table 2.

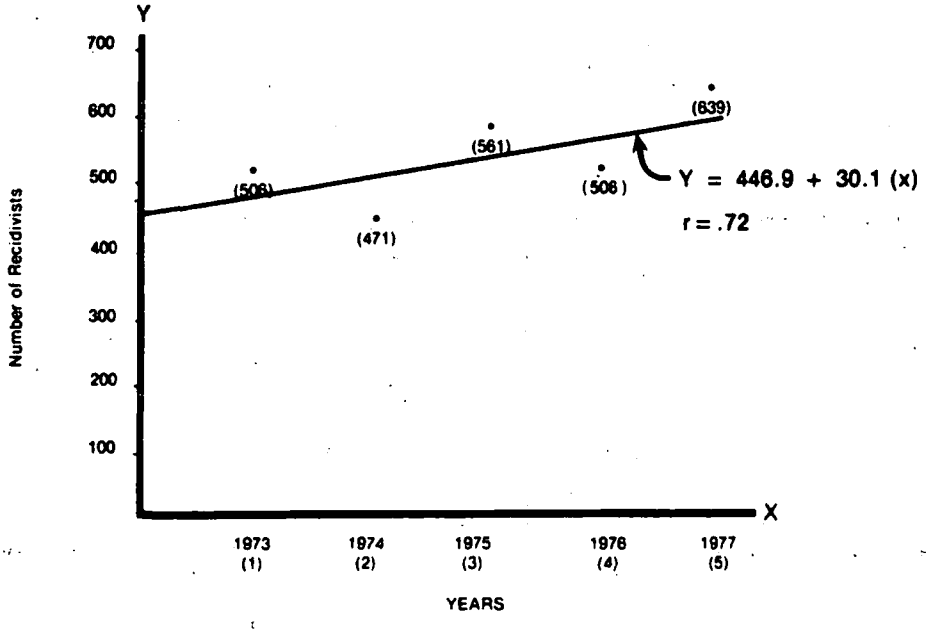
Number of Recidivists Per Year



Source: Chaos City Dept. of Corretions, 1978.

Table 3.

Number of Recidivists Per Year

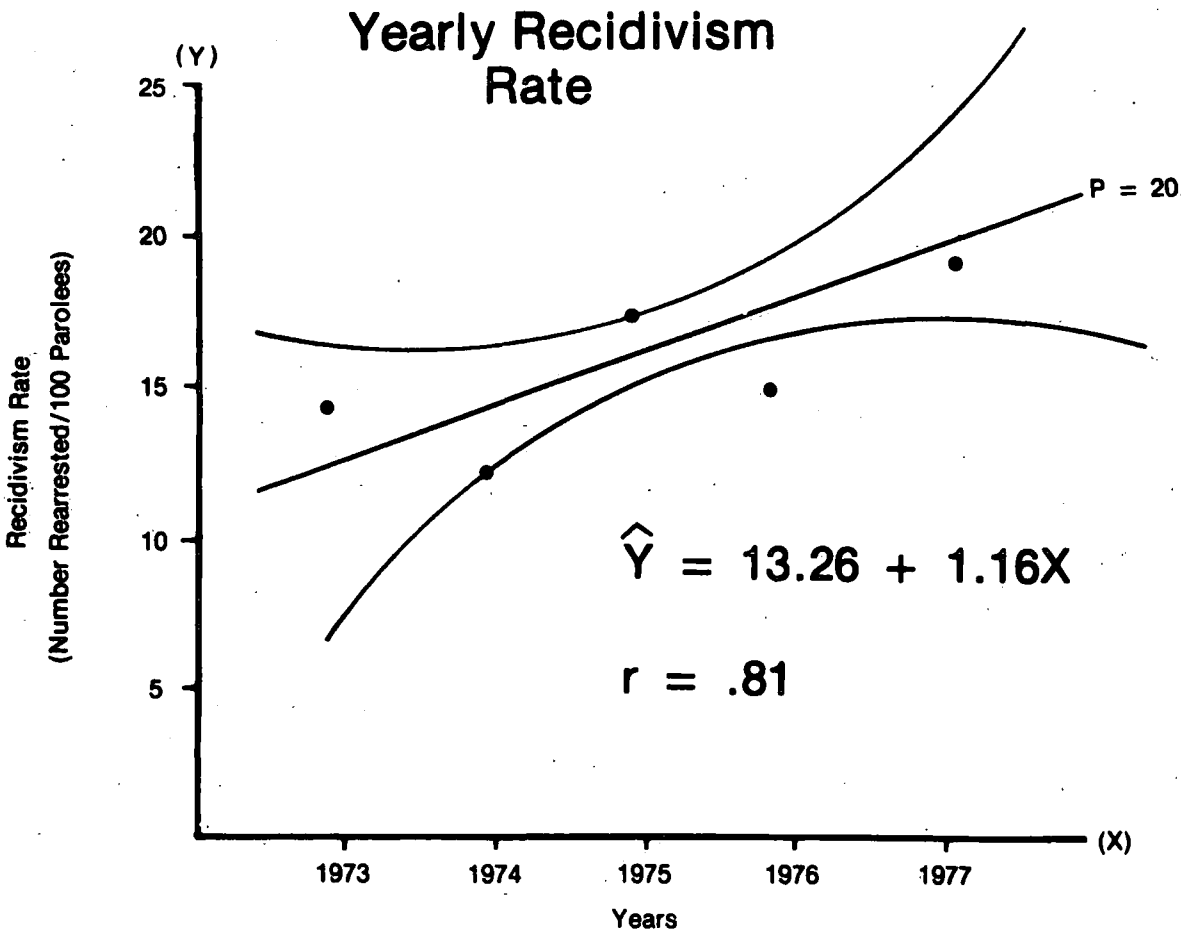


Source: Chaos City Dept. of Corrections

DATA SET

QUESTION #2: Estimate the parolee recidivism rate for 1978.

Table 4.



EXERCISE #6

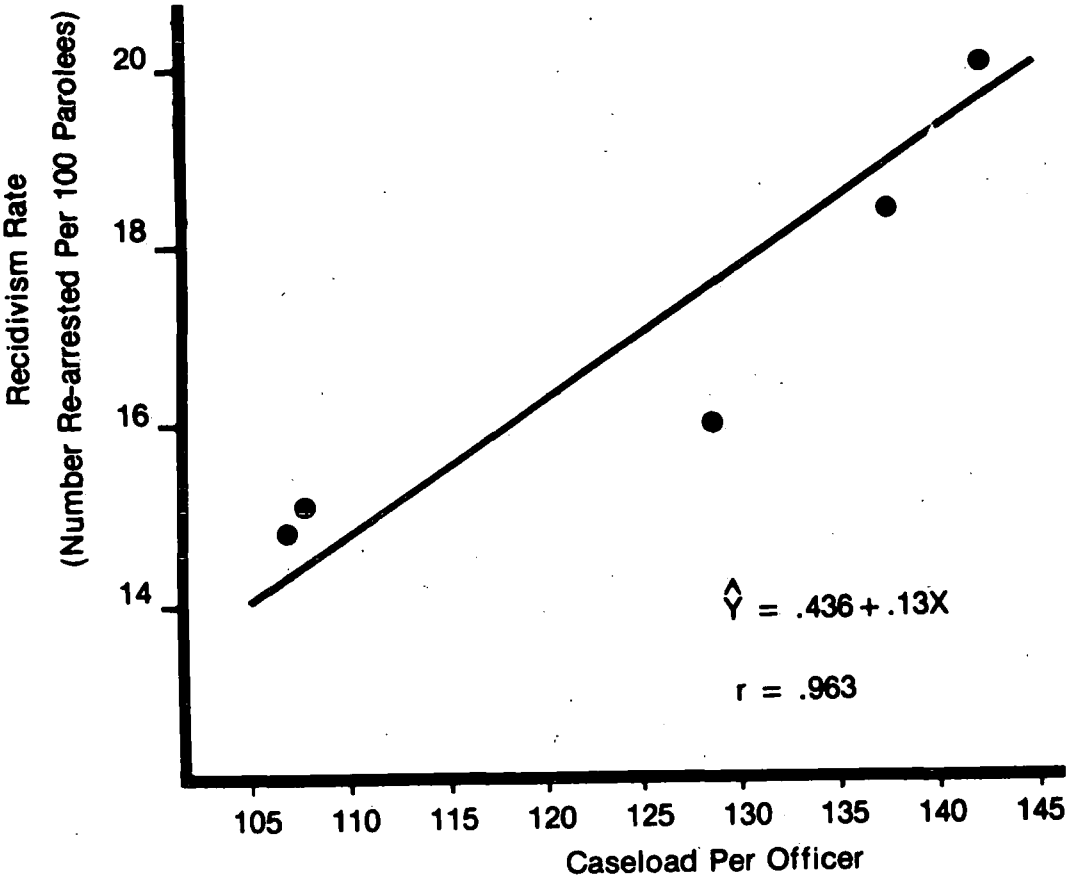
Source: Chaos City Dept.
of Corrections, 1978.

DATA SET

QUESTION #3: What is the relationship between the case load per officer and the recidivism rate?

Table 5.

Recidivism Rate Related to Parole Officer Caseload



Source: Chaos City Dept. of Corrections

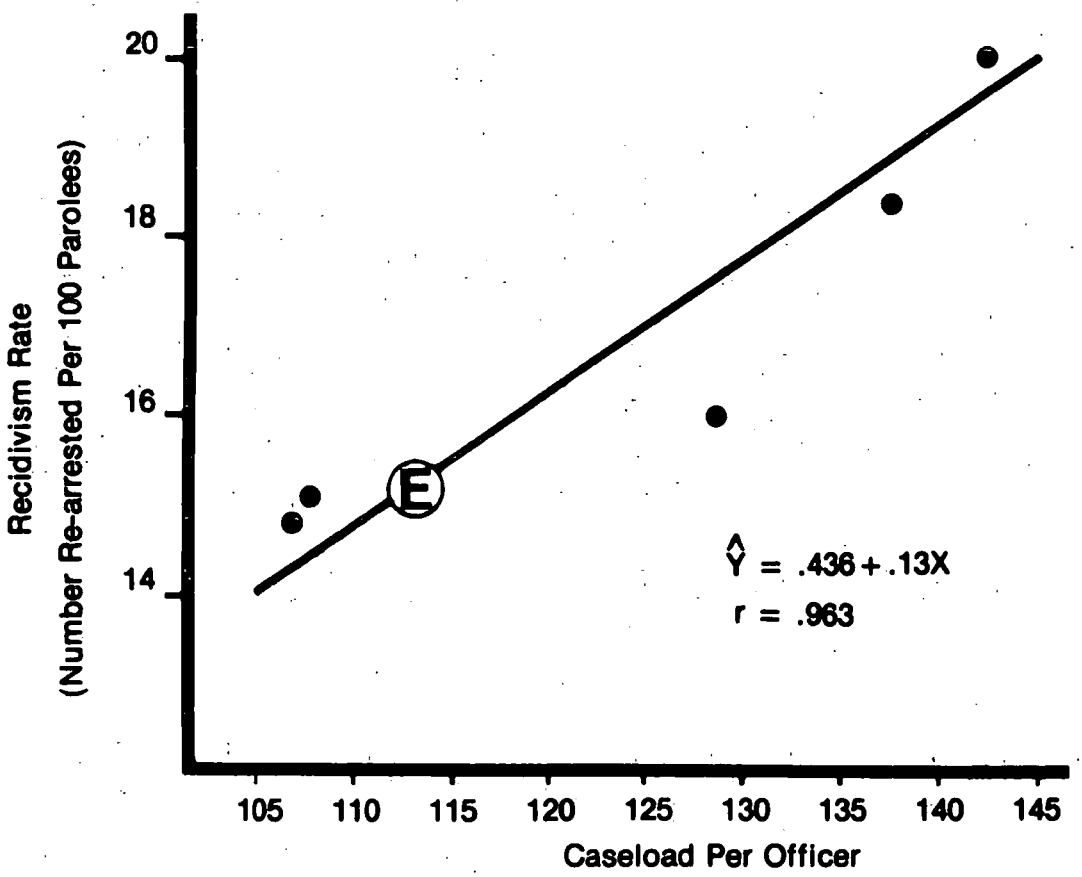
EXERCISE #6

DATA SET

QUESTION #4: If existing workloads were reduced 20%, what effect would this have on recidivism?

Table 6.

Recidivism Rate Related to Parole Officer Caseload



Source: Chaos City Dept. of Corrections

EXERCISE #6

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

	Caseload			Totals
	Low (70-109)	Medium (110-149)	High (150-189)	
Parolees with Technical Violations	859** (43.2%)	3273 (30.6%)	608 (17.8%)	4740
Parolees with no Technical Violations	1130 (56.8%)	7421 (69.4%)	2815 (82.2%)	11366
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, 2 d.f.) = 5.99

EXERCISE #6

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 #6

WORKSHEET (continued)

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

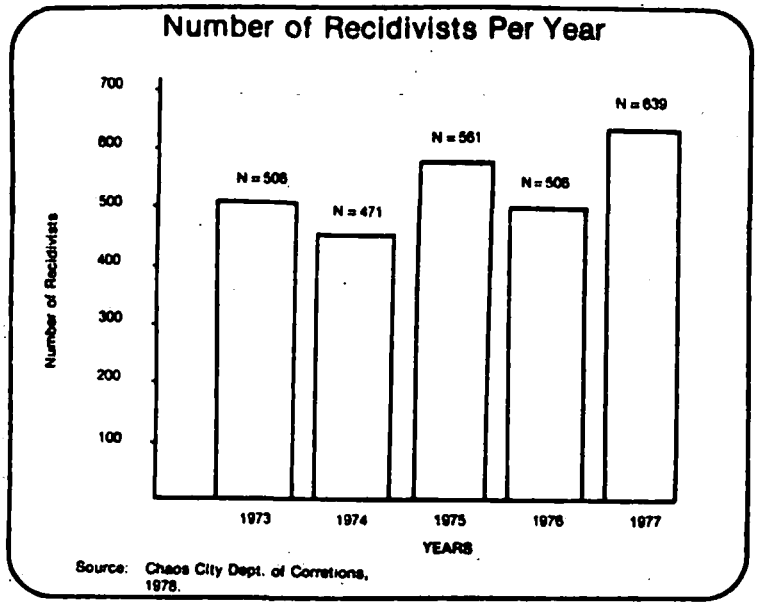
EXERCISE #6

DEBRIEFING NOTES

A. Question 1

Describe the trend in recidivism for parolees during the past five years?

SHOW ANSWER (Answer 6-a):



EMPHASIZE (Answer 6-a):

+ $\bar{X}$ = 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.

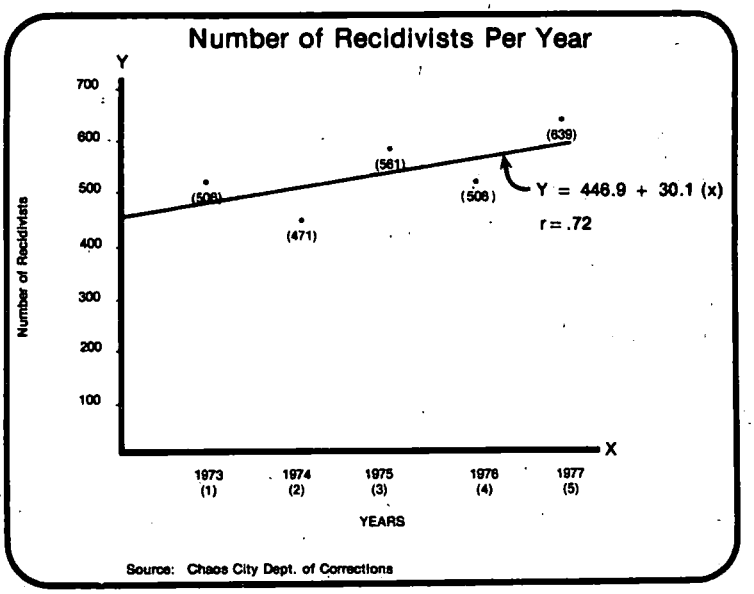
EXERCISE #6

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

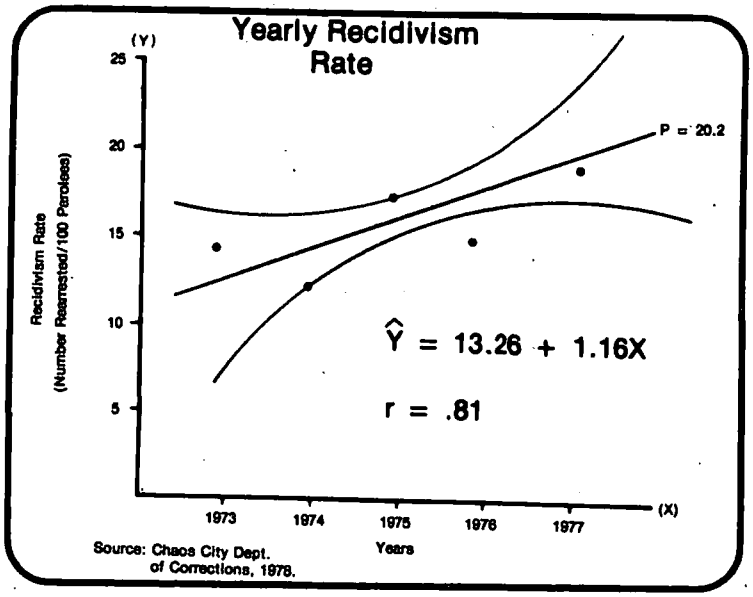
EXERCISE #6

DEBRIEFING NOTES

B. 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

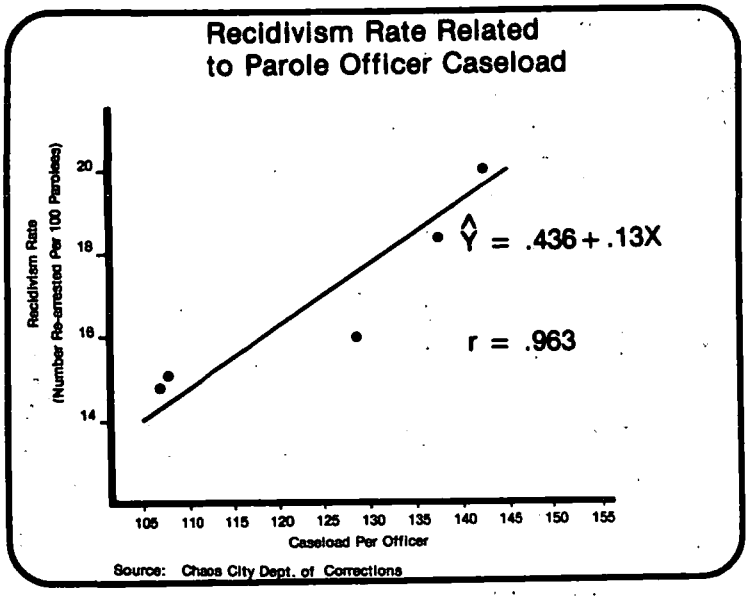
EXERCISE #6

DEBRIEFING NOTES

C. Question #3

What is the relationship between the caseload per parole officer and the recidivism rate?

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

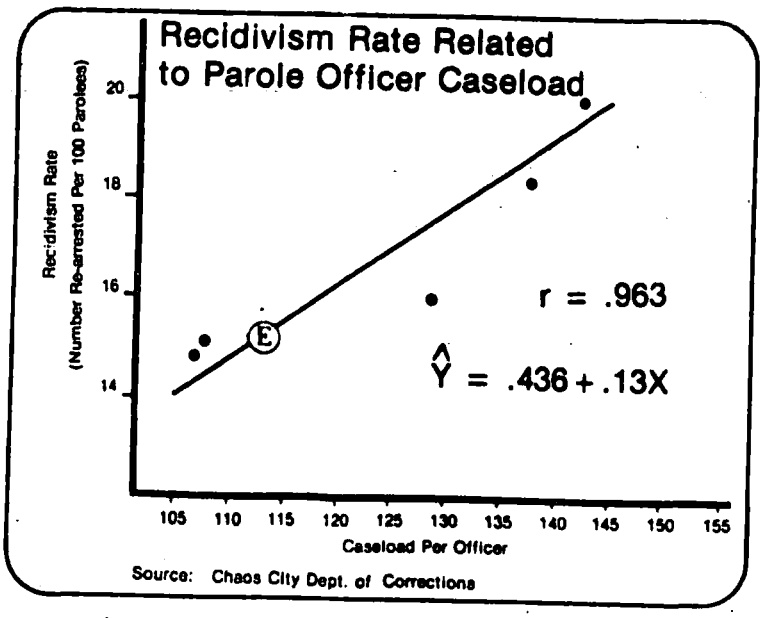
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DEBRIEFING NOTES

D. Question #4

If existing caseloads (142 parolees per officer) were reduced 20% what effect would this have on recidivism?

SHOW ANSWER (Answer 6-e):



EMPHASIZE (Answer 6-e):

+ Caseload in 1977 = 142 parolees per officer

+ Prediction Equation $\hat{Y} = .436 + .13X$

  20% Reduction: = 113.6 parolees per officer

  If X = 113.6 $\hat{Y}$ = .436 + .13 (113.6) = 15.2 Recidivists/100 parolees.

+ Interpretation: A 20% reduction in the 1977 caseload level from about 19.8 recidivists per 100 parolees to 15.2.

+ 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
  (4) Is it valid to presume that a reduction in caseload would result in a reduction in recidivism rate? Increasing time available for the parole officer may result in an increase in rearrest based on technical violations.

EXERCISE #6

DEBRIEFING NOTES

E. 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			TOTALS
	Low 70-109	Medium 110-149	High 150-189	
Parolees with Technical Violations	859 (43.2%)	3273 (30.6%)	608 (17.8%)	4740 (29.4%)
Parolees with no Technical Violations	1130 (56.8%)	7421 (69.4%)	2815 (82.2%)	11366 (70.6%)
TOTALS	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.

+ 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.)

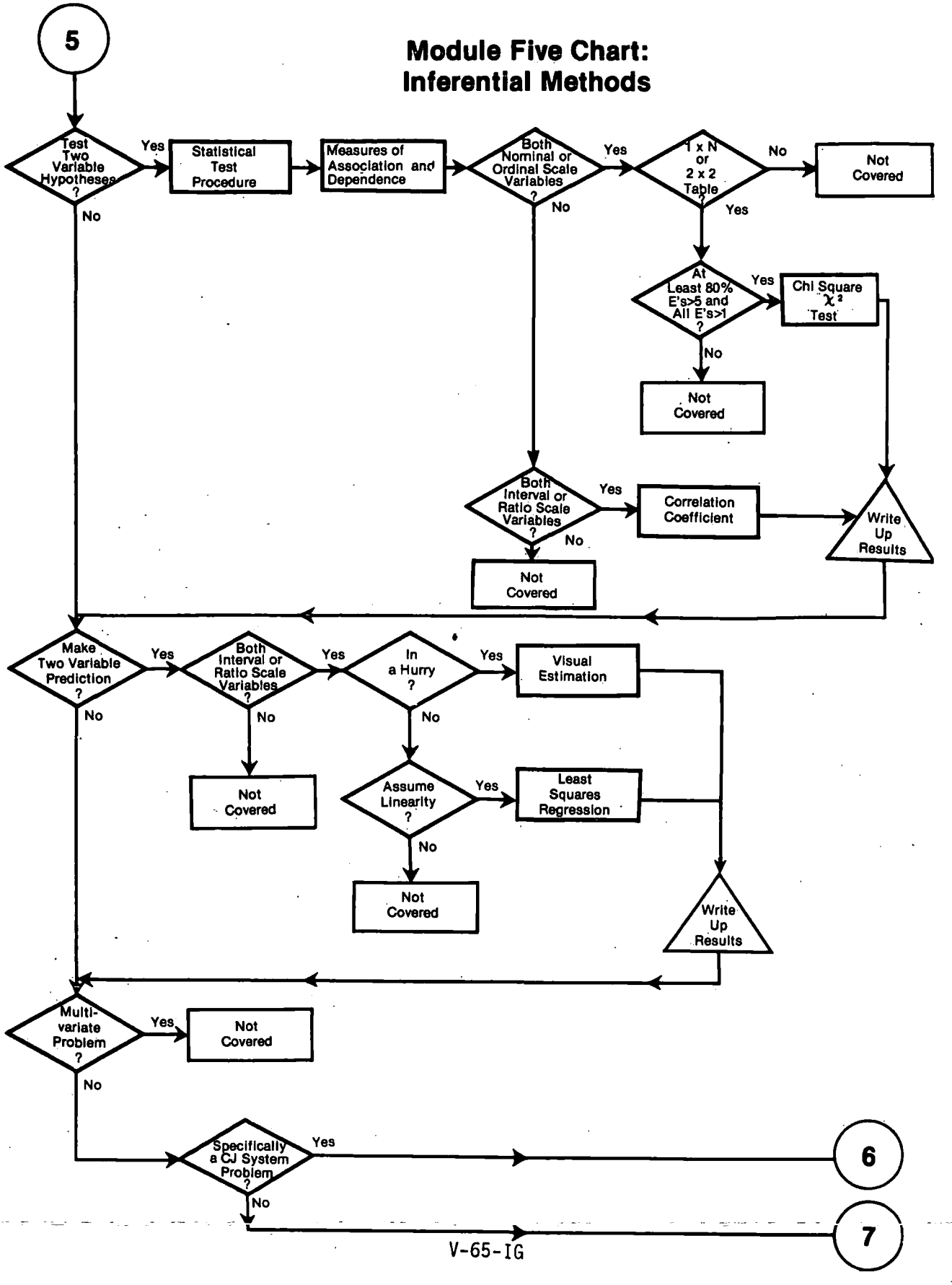
+ Reliability questions: What changes over time occurred in counting caseloads and violations?

NOTES

VI. CONCLUSION

A. Review the Module Chart and respond to participant questions. Begin the Briefing of Task #3 of the Major Exercise.

SHOW V.A. (5-18):


5
Module Five Chart:
Inferential Methods
Test Two Variable Hypotheses ?
Yes
Statistical Test Procedure
Measures of Association and Dependence
Both Nominal or Ordinal Scale Variables ?
Yes
1 x N or 2 x 2 Table ?
No
Not Covered
Yes
No
At Least 80% E's>5 and All E's>1 ?
Yes
Chi Square χ^2 Test
No
Not Covered
No
Both Interval or Ratio Scale Variables ?
Yes
Correlation Coefficient
Write Up Results
No
Not Covered
Make Two Variable Prediction ?
Yes
Both Interval or Ratio Scale Variables ?
Yes
In a Hurry ?
Yes
Visual Estimation
No
No
No
Not Covered
Assume Linearity ?
Yes
Least Squares Regression
No
Not Covered
Write Up Results
Multi-variate Problem ?
Yes
Not Covered
No
Specifically a CJ System Problem ?
Yes
6
No
7

MODULE 6
DATA INTERPRETATION -- SYSTEM

The purpose of Module 6 is to introduce system analysis and to illustrate the use of the system variables and related measures in analyzing the criminal justice system.

The instructor should define carefully, using appropriate examples and illustrations, the concepts, variables and measures introduced in this module. The Walk-Through illustration of input-output flow analysis should be used to discuss application of system analysis.

OBJECTIVES

1. To describe criminal justice system problems using:

    a. System Concepts, Variables and Measures
    b. Flow Charts
    c. Descriptive Methods

2. To analyze the system using:

    a. System Concepts, Variables and Measures
    b. Comparative Methods
    c. Input/Output Flow Analysis

SCHEDULE

DATA INTERPRETATION - SYSTEM

TIME ALLOCATION

TOPIC	TIME	PAGE
I. INTRODUCTION	10 minutes	VI-3
A. What is a System?	5 minutes	VI-3
B. What is the Criminal Justice System?	5 minutes	VI-4
C. How can the Criminal Justice System be Analyzed?	*	VI-7
II. FLOW CHARTS	40 minutes	VI-7
A. Uses	5 minutes	VI-7
B. Types	5 minutes	VI-7
Walk-Through 'K' FLOW CHARTS	30 minutes	VI-12
III. SYSTEM CONCEPTS	70 minutes	VI-20
A. Overview	*	VI-20
B. Environment	5 minutes	VI-21
C. Administration	*	VI-21
D. System Operations	10 minutes	VI-21
E. System Operations Variables	15 minutes	VI-26
Walk-Through 'L' FLOW ANALYSIS	40 minutes	VI-34
IV. CONCLUSION	10 minutes	VI-45
TOTAL TIME	120 minutes	

* Less than 5 minutes

NOTES

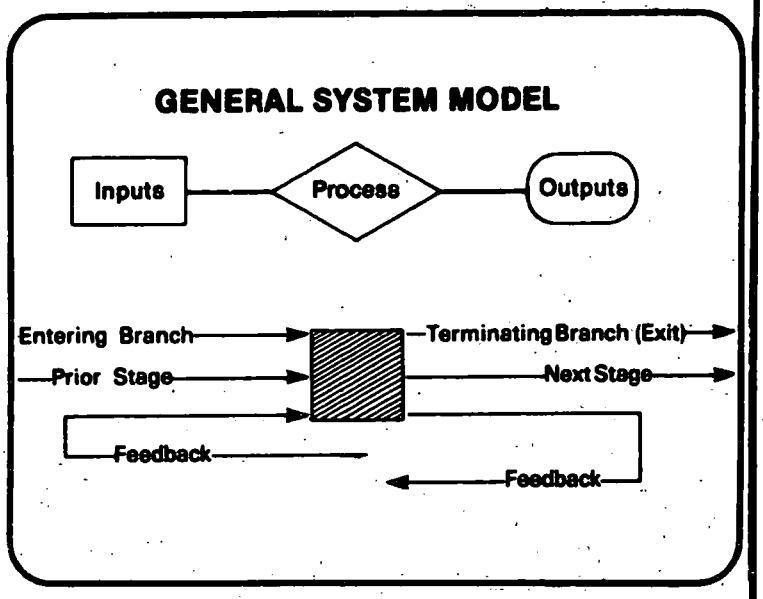
I. INTRODUCTION

A. What is a System?

1. A system is "a regularly interacting or interdependent group of items forming a unified whole."

- Common goals.
- Dynamic character.
- Input/output model.

SHOW V.A. (6-1):



EMPHASIZE (6-1):

+ The generalizable character of this model.

+ Can be applied to into most administrative processes either at the "macro" e.g., criminal justice system level, or "micro" level, e.g., police department.

+ Explain model terms.

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. Examples of external system inputs are community attitudes toward crime, public per capita expenditures for the criminal justice system, and legislation. The influx of new offenders also may be considered an external input, however, the flow of recidivists is often treated as an internal criminal justice input. Internal inputs would be the flow of offenders between criminal justice agencies and agency activities that impact the criminal justice system, such as court decisions that affect police and corrections.

   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.

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.

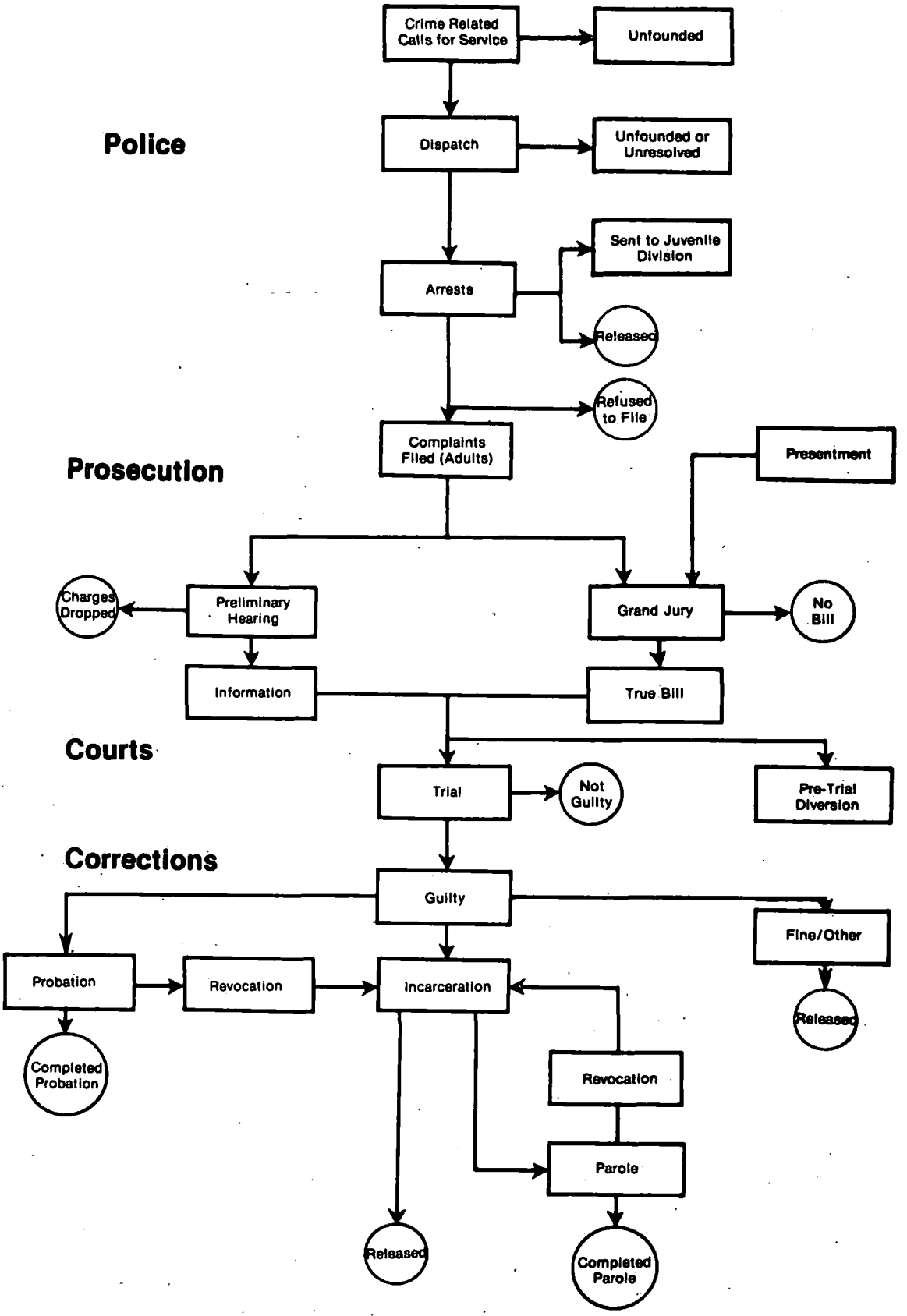
   c. The primary inputs to the system are the criminal acts.

   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



C. How can the Criminal Justice System be Analyzed?

1. Flow charts.

2. Input/Output analysis.

3. Within these system analysis techniques using the tools taught in Modules 3, 4, and 5.

II. FLOW CHARTS

A. Uses of Flow Charts.

1. Aid to Reader or Audience.

2. It clarifies thinking.

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 provided an example.

2. Operations charts.

a. Shows essential operational aspects of the system.

b. Exhibit 2 provides an example.

c. Note that:

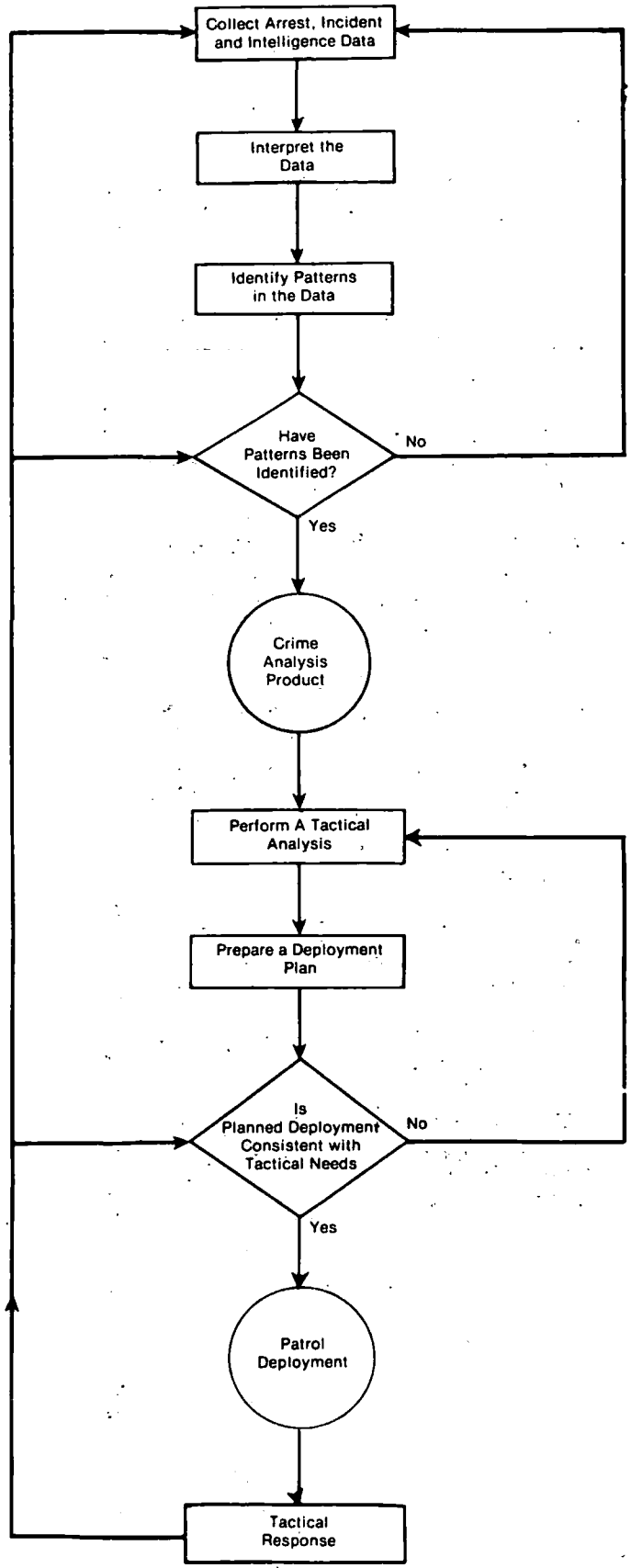
- A rectangle should be used to present an instruction or information.

- 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.

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 PERT Charts.

4. Organizational Patterns.

   a. Exhibit 3 is an organizational chart for Chaos City's Regional Planning Unit.

   b. Shows 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.

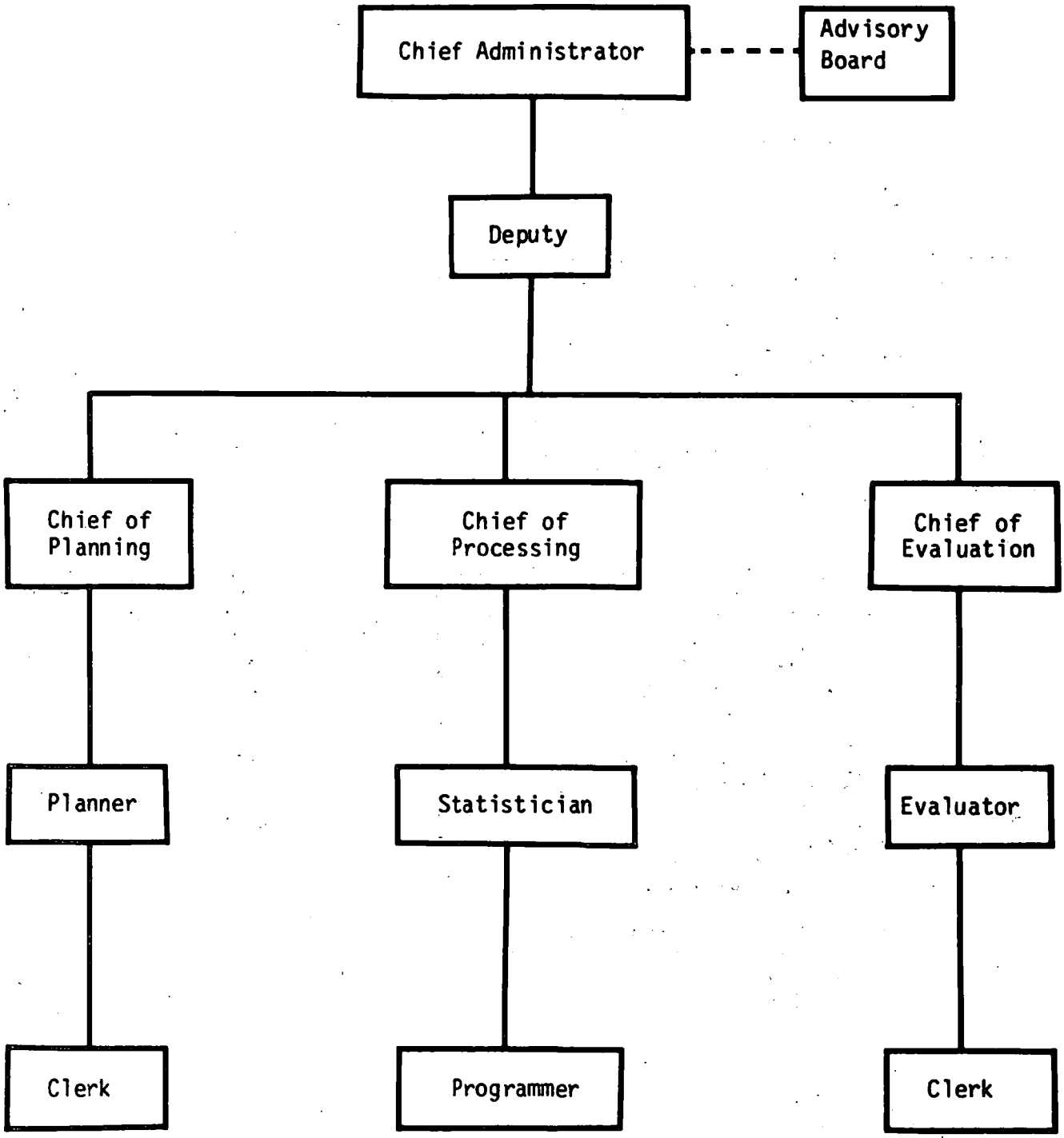
   a. A statistical flow of offenders may diverge or converge leading to one or several outcomes. This is the principle of a disposition tree.

   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.

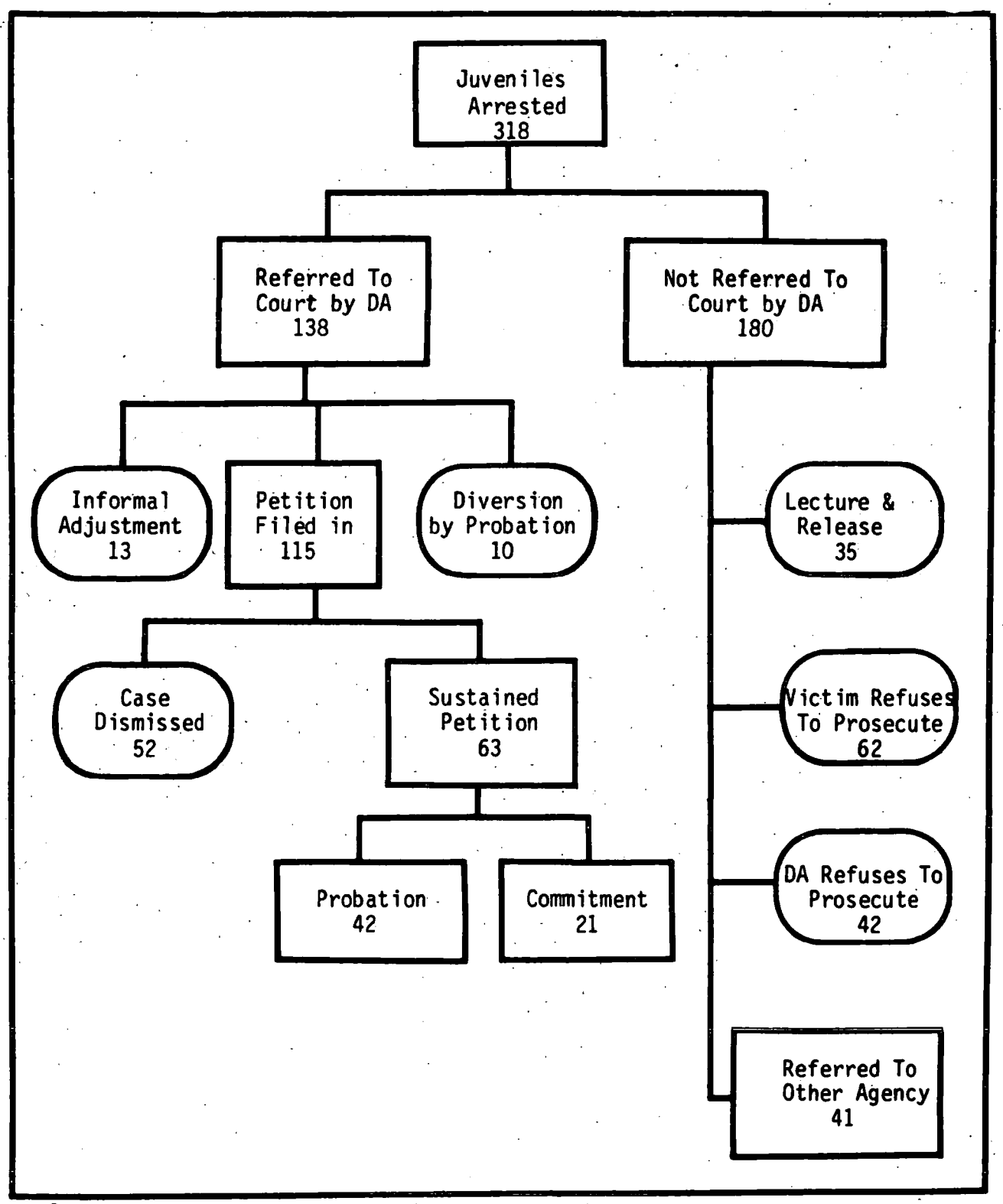
   d. The use and interpretation of various types of disposition trees is covered in the next section.

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: Chaos City Regional Planning Unit, 1977.

WALK-THROUGH 'K'

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. 6-2).

B. Interpret the disposition with input percentages (V.A. 6-3).

C. Interpret the disposition tree with decision point percentages (V.A. 6-4).

D. Interpret the disposition tree with elapsed time (V.A. 6-5).

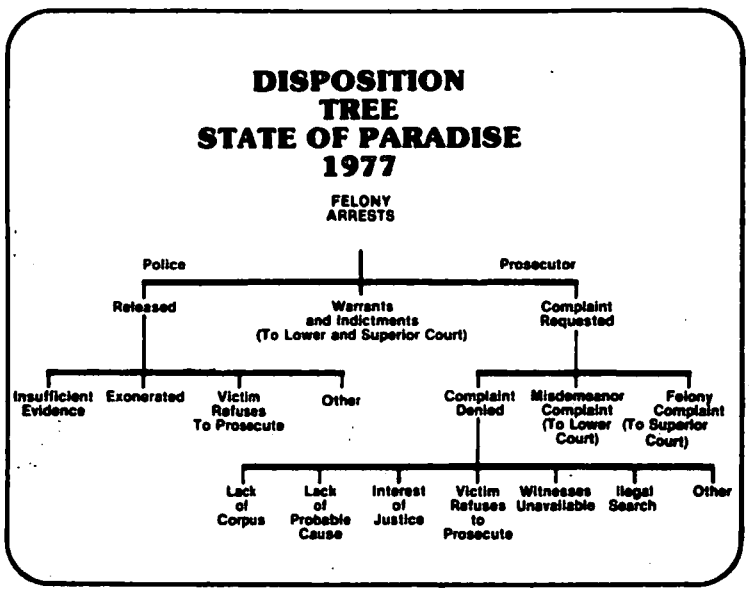
E. The time available for this Walk-Through is 30 minutes.

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.

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.

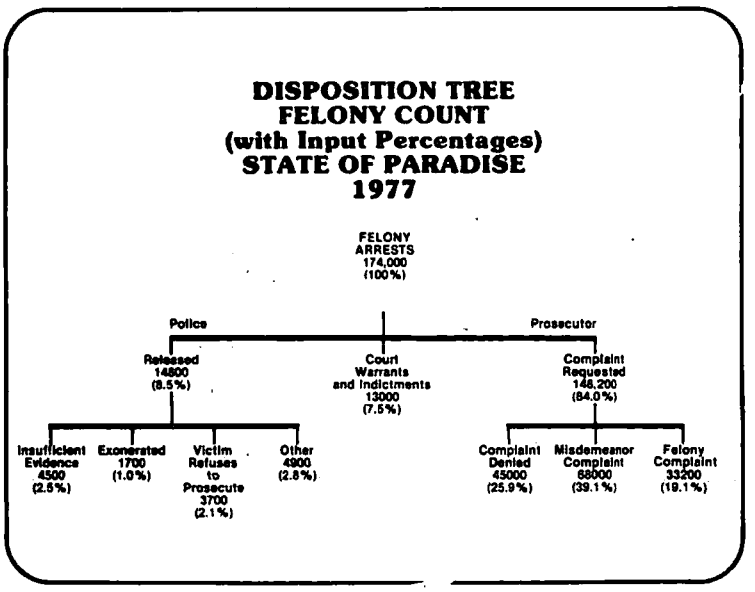
+ Try to anticipate offender flows with participants.

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.

NOTE:

1. Table 1 presents a different perspective on the data in V.A. 6-3.

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 (44.7)
• 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

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	89,820	11,684	7,622	2,211	676	330	246	599	4,062
- (% total)	(51.6)	(59.3)	(61.7)	(58.3)	(51.0)	(48.3)	(48.6)	(57.7)	(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	84,249	8,014	4,729	1,582	650	354	260	439	3,285
- (% total)	(47.2)	(40.7)	(38.2)	(41.7)	(49.0)	(51.7)	(51.3)	(42.4)	(44.7)
• 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

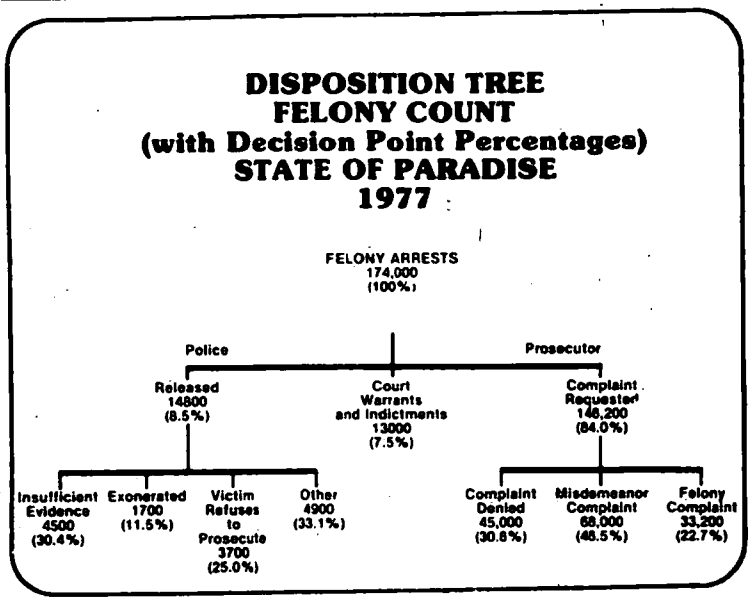
r = .66

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.

NOTE:

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).

WALK-THROUGH 'K'

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

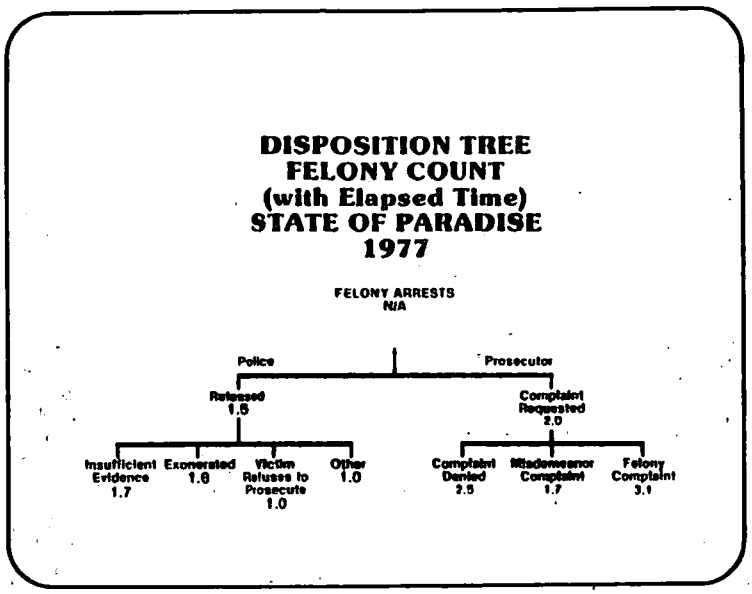
Source: Chaos County, 1977.

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

D. Disposition tree with elapsed times.

SHOW V.A. (6-5):



EMPHASIZE (6-5):

+ This format represents for each limb, average elapsed time from point of arrest to release or to complaint requested and from there to disposition.

+ Time is measured in days and includes weekends.

E. Limits and uses of transaction data and summary tabulations. Table 3 concludes the Walk-Through.

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 when 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.

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. Environment, administration and system operations are difficult concepts to specify.

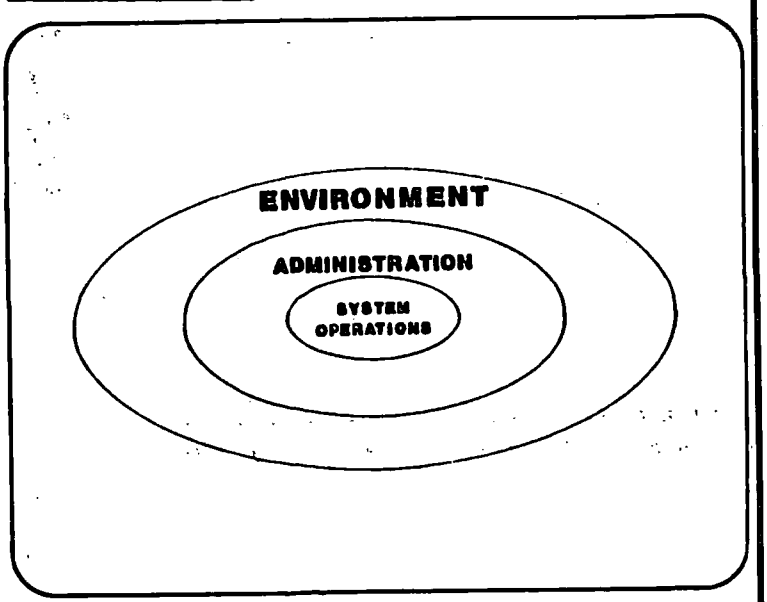
2. All three are interrelated.

3. The following discussion will first consider definitions of the environment and administration.

4. Next, within the context of system operations will be a discussion of system operations variables.

5. Finally, there is a comprehensive illustration of how these concepts and variables can be applied to system problems.

SHOW V.A. (6-6):



NOTES

B. Environment.

1. Refer to Exhibit 5, define the concept, and discuss how it may be applied.

C. Administration.

1. Refer to Exhibit 6 and discuss the definition, examples and applications.

D. Systems Operations.

1. Refer to Exhibit 7 and discuss the definition, examples and applications.

Exhibit 5. Environment

I. THE CONCEPT CONSIDERS:

What factors outside the system affect the system?

II. CONCEPTUAL DEFINITION:

External interactions with the criminal justice system. Crime and community characteristics which affect and are affected by the criminal justice system.

III. EXAMPLES:

Community Characteristics	Crime Characteristics
Population	Type
Population Change	Magnitude
Population Density	Rate of Change
Racial Composition	Offender Characteristics
Households Receiving Aid to Families with Dependent Children	Victim Characteristics
Unemployment Rate	Crime Characteristics
Juvenile Population	
Attitudies	

IV. 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 THE CONCEPT CONSIDERS:

How is the work to be organized and managed? What are the goals and standards?

II. CONCEPTUAL DEFINITION:

Organization, management and operations of the criminal justice system, components and agencies.

III. EXAMPLES:

- Agency Goals and Standards.
- 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. System Operations

I. THE CONCEPT CONSIDERS:

How does the system function and how do components within the system interrelate?

II. CONCEPTUAL DEFINITION:

The activities of a regularly interreacting group of agencies forming a unified whole and with a common goal.

III. EXAMPLES:

- Water and Sewer System.
- School System.
- State Corrections System.
- State University System.
- Interstate Highway.
- Postal System.
- Criminal Justice System.

IV. DISCUSSION

- Criminal Justice System is one of the most complex systems.
- System Operations can be further refined in terms of variables such as standards, goals, input, performance and outputs. These variables are explained further in the following section.

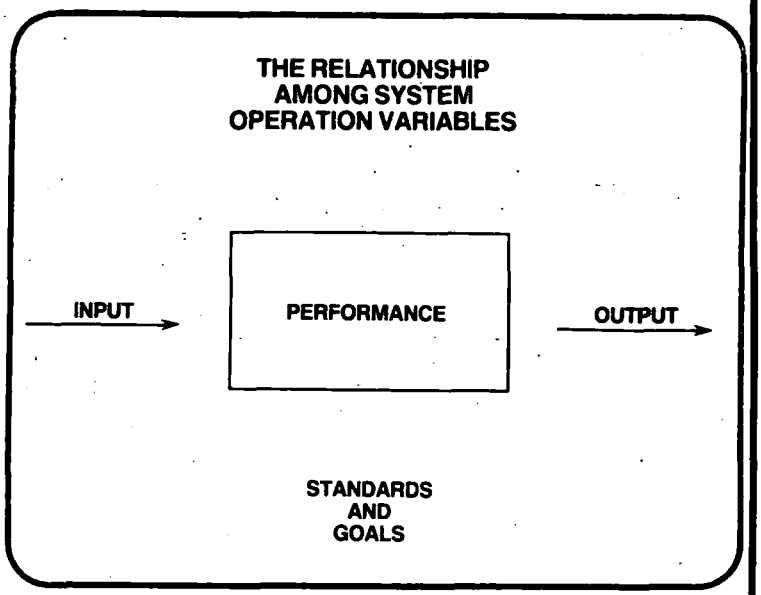
E. System Operations Variables and Measures

1. As indicated in Exhibit #7, the concept of System Operations can be further defined as the variables:

   - Standards
   - Goals
   - Input
   - Performance
   - Output

2. Consider the relationship of these variables in an input/output model:

SHOW V.A. (6-7)



EMPAHSIZE 6-7:

+ Standards and Goals are determined in Administration. Once determined, they serve as a framework for System Operations.

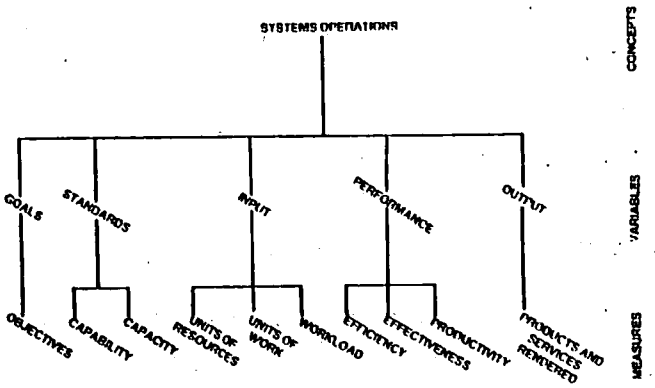
+ Input and Output can be measured more readily than Performance. One of the primary purposes of systems analysis is to help the analyst measure Performance.

---

3. The measures which can be used to operationalize Systems Operations variables are illustrated in the chart provided in V. A. 6-8.

SHOW V.A. (6-8):

ELABORATION OF SYSTEM OPERATIONS



EMPHASIZE 6-8

+ Illustrates the break-out and relationship of variables and measures to the concept of System Operations.

+ These variables and measures are used as the basis for systems analysis in this Module.

+ Use Exhibits 8-13 to further explain these variables and measures:

  - Standards (Exhibit 8).
  - Goals (Exhibit 9).
  - Input (Exhibit 10).
  - Performance (Exhibit 11).
  - Output (Exhibit 12).
  - Summary (Exhibit 13).

Exhibit 8. Standards

I. THE VARIABLE CONSIDERS:

The ideal conditions for System Operations

II. VARIABLE DEFINITION:

An established criteria by which qualitative and quantitative judgements can be made.

III. MEASURES:

Standards are usually qualitative and or quantitative criteria for system performance which have external validity. Two commonly used performance standards are capability and capacity.

A. Capability is the expected level of output at a planned level of productivity with a specified amount of resources in a given time period.

Capability = Resource Measure X Productivity Standard

B. Capacity is the potential output when productivity is maximized with a specified level of resources in a given time period.

Capacity = Resource Measure X Maximum Productivity Standard

IV. EXAMPLES:

A. Capability: Assuming a productivity standard of 1,800 cases per judge per year and a court with 15 judges, the capability of the court would be 27,000 cases per year.

15 judges X 1800 cases/judges = 27,000 cases/year

B. Capacity: The minumum case cost during 1977 was determined to be $210 and this figure is assumed to be a reasonable indicator of maximum productivity. Given an annual budget of $6,500,000 and assuming a maximum productivity of $210 per case, 30,952 cases could be processed.

$6,500,000 ÷ $210/case = 30,952 cases

Exhibit 9. Goals

I. THE VARIABLE CONSIDERS:

Expectations for system performance

II. VARIABLE DEFINITION:

A desired future state; plans expressed as results to be achieved, usually general and not time limited.

III. MEASURES:

Goals are made measurable when expressed as objectives.

An objective is a specific condition to be attained by a specific set of activities, stated in time-limited and measurable terms.

IV. EXAMPLE:

Paradise Department of Corrections should provide high quality mental health care at all correctional institutions.

Exhibit 10. Input

I. THE VARIABLE CONSIDERS:

What will be processed?

II. VARIABLE DEFINITION:

The work to be processed and the resources allocated to enable processing.

III. MEASURES:

There are three common measures of input:

A. Units of Resources: Units of manpower, funds, and facilities to process work through the criminal justice system or its components.

B. Units of Work: Units of persons, things or endeavors to be processed through the criminal justice system or its components within a specific time period; usually some level of priority has been assigned to the work.

C. Workload: The units of work to be processed per unit of resource in a given amount of time; usually expressed as a rate that compares measures of work to be processed with measures of resources budgeted.

$$\text{Workload} = \frac{\text{Work Measure}}{\text{Resource Measure}}$$

IV. EXAMPLES:

A. Units of Resources for an Anti-fencing Unit:

Budget = $60,000
Personnel = five full time sworn officers and one secretary.
Equipment = three police cars; one video camera/recorder, etc.

B. Units of Work: 150 motor vehicle accidents to investigate in January.

C. Workload: 30 investigations per officer to be investigated in January.

V. DISCUSSION:

A. When measuring resources make distinctions between:

- Operating staff (Detectives, etc.) and support staff (Clerks).
- Capital expenditures and operating expenditures.
- Fixed costs and variables costs.

B. Generally, work measures cannot be directly compared between system components because measures vary among agencies.

C. The Output of one system component (the number of work units which are processed in a given amount of time) becomes the Work to be processed by a subsequent component of the system.

Exhibit 11. Performance

I. THE VARIABLE CONSIDERS:

The activities of organizations, units and individuals.

II. VARIABLE DEFINITION:

The execution of policy, the conduct of operations and the accomplishment of tasks.

III. MEASURES:

There are three common measures of performance:

A. Productivity: The amount of work that can be produced or processed with specified resources in a given amount of time. Productivity is usually expressed as a rate that compares measures of output with measures of resources budgeted or consumed per unit of time.

$$\text{Productivity} = \frac{\text{Output Measure}}{\text{Resource Measure}}$$

B. Efficiency: The amount of work to be done which is accomplished in a specified time. Generally, efficiency is expressed as a ratio of output to work. 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.

$$\text{Efficiency} = \frac{\text{Output Measure}}{\text{Work Measure}}$$

C. Effectiveness: The extent to which standards, goals, objectives and estimates are achieved. Measures of effectiveness compare the output achieved to a planned output or standard and are usually expressed as rates or percentages.

$$\text{Effectiveness} = \frac{\text{Output Measures}}{\text{Standard}}$$

IV. EXAMPLES

A. Productivity: In December a five man squad investigated 80 accidents.

$$\text{Productivity} = \frac{\text{80 accidents}}{\text{5 officers}} = \text{16 accidents per officer}$$

B. Efficiency: In 1978, the Chaos City Police Department followed up 10,989 out of a total of 46,560 reported larceny thefts.

$$\text{Efficiency} = \frac{\text{10,989 larceny thefts follow-ups during 1978}}{\text{46,560 reported larceny thefts during 1978}} = 23.6\%$$

C. Effectiveness: The objective of a police department is to establish a response time on all non-emergency calls at not greater than 6 minutes. During the last year a sample of calls (n-685) was taken. 620 of those calls had response times of 6 minutes or less.

$$\text{Effectiveness} = \frac{\text{620 Responses w/in 6 minutes}}{\text{685 calls requiring response within 6 minutes}} = 90.5\%$$

V. DISCUSSION

A. Productivity and efficiency 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.

C. Effectivness measures are often difficult to estimate since goals and standards are often qualitative and not amenable to quantification.

D. Frequently the comparison of workload expected and actual productivity during specific time periods provide a basis for refining estimates of capability, capacity and performance standards and objectives.

Exhibit 12. Output

I. THE VARIABLE CONSIDERS:

The products and services produced.

II. VARIABLE DEFINITION:

The number of workload units processed or produced at the end of specified time period.

III. MEASURES:

Output is generally measured in terms of units produced or services rendered in a specified time period.

IV. EXAMPLES:

A. Products: The Prosecuting Attorneys office filed 36 complaints in District Court during January.

B. Services: The Traffic Division investigated 80 accidents in December.

V. DISCUSSION

A. Output measures are most frequently expressed in terms of products and services produced.

B. Remember the output of one component can become the work for the subsequent component.

Exhibit 13. Summary of System Concepts, Variables and Measures

I. ENVIRONMENT:

What factors outside the system affect the system?

II. ADMINISTRATION:

How is the work to be organized and managed? What are the goals and standards?

III. SYSTEM OPERATIONS:

How does the system function and how do components within the system interrelate?

A. Goals: What is expected?

1. Objectives: What is expected in a given time period?

B. Standards: What is ideal?

1. Capability: How much is expected to be done?

2. Capacity: How much can be done using maximum potential?

C. Input: What is to be processed?

1. Resources: What is available to work with?

2. Work: What is to be done?

3. Workload: How much has to be done per unit of resources?

D. Performance: What are the results?

1. Productivity: What results are accomplished with the resources used?

2. Efficiency: How much of the work to be done is done?

3. Effectiveness: How does the result compare to goals, standards, objectives or estimates?

E. Output: What has been done?

PURPOSE

This Walk-Through illustrates input/output flow analysis using indexes and provides an example of the analysis of systems operations. It demonstrates the relationships among system variables and demonstrates how to measure and interpret these variables.

INSTRUCTOR NOTES

A. In introducing the Walk-Through, cover the following:

1. This is an example of input/output analysis utilizing system variables and measures.

2. This a comparative analysis using indexes derived from system measures.

3. 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-cases

b. Process-court trials

c. Output-final dispositions

d. Feedback-backlog

2. Point out concerns about:

a. Backlog

b. Low number of convictions

3. The Walk-Through will analyze backlog problem and assess strategies to reduce court backlog.

C. Measuring System Variables (Section A-E of Data Set and Worksheet)

1. Analysis of problem (backlog) will be accomplished using system variables 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 variable 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 work 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. This 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.

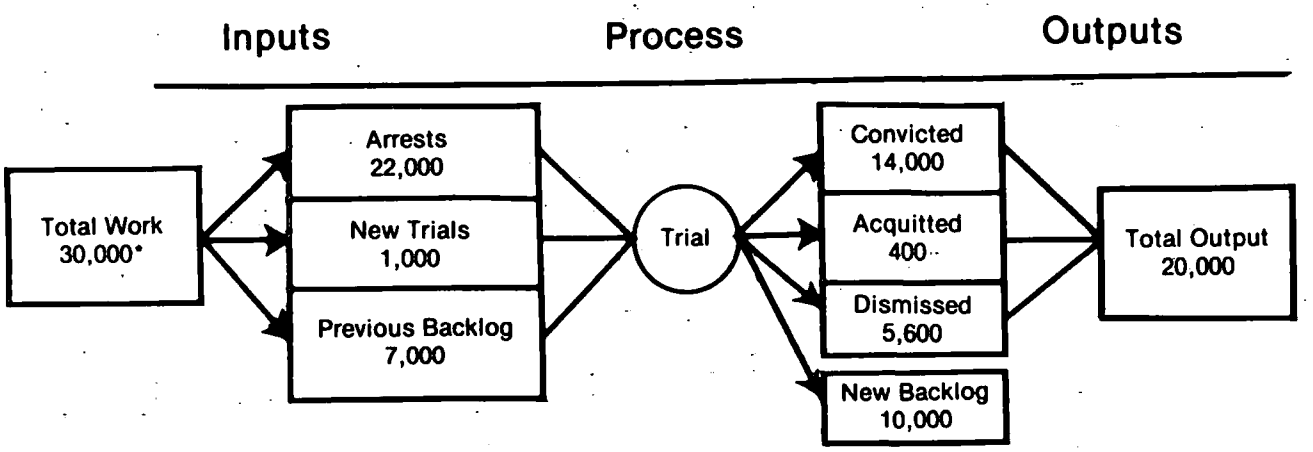
   c. This strategy implies cases must be tried in less time - which has implications for the quality of justice and fairness of the process.

   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. 96,000 Minutes/Judge/Year
4. 24,000 Judge/Hours/Year
5. $6.5 Million Budgeted
   $6.0 Million Expended

B. Work/Output

1. Work is 30,000 Cases/Year

2. Output is 20,000 Cases/Year

WALK-THROUGH 'L'

C. Workload (Based on Resource and Work Measures)

1. 2,000 cases per judge per year required to process existing workload

$$WL_1 = \frac{W}{R} = \frac{30{,}000 \text{ Cases/Year}}{15 \text{ Judges}} = 2{,}000 \text{ Cases/Judge Year}$$

*2. .8 judge hours per case required to process existing workload

$$WL_2 = \frac{R}{W} = \frac{24{,}000 \text{ Judge-Hours/Year}}{30{,}000 \text{ Cases/Year}} = .8 \text{ Judge-Hours/Case (48 minutes)}$$

D. Productivity (Based on Resources & Output Measures)

1. 1,333 Cases/Judge were tried last year.

$$P_1 = \frac{O}{R} = \frac{20{,}000 \text{ Cases}}{15 \text{ Judges}} = 1{,}333 \text{ Cases/Judge}$$

*2. $300 per case

$$P_2 = \frac{R}{O} = \frac{\$6.0 \text{ Million}}{20{,}000 \text{ Cases}} = \$300/\text{Case}$$

*3. 1.2 Judge-Hours per Case (72 minutes)

$$P_3 = \frac{R}{O} = \frac{24{,}000 \text{ Judge-Hours/Case}}{20{,}000 \text{ Cases/Year}} = 1.2 \text{ Judge-Hours/Case (72 minutes)}$$

*Instructor's Note: These are accepted reciprocal relationships that are commonly used to express workload and productivity.

WALK-THROUGH 'L'

E. Efficiency

1. Based on time series comparison.

Year	1972	1973	1974	1976	1977
Work	28,000	28,500	28,200	29,100	30,000
Output	15,000	14,000	15,050	16,000	20,000

$$\text{Efficiency} = \frac{\text{Output Measure}}{\text{Work Measure}}$$

a. $E_{77} = 66.6\% = \frac{\text{Output}}{\text{Work}} = \frac{20,000}{30,000} \times 100$

$E_{72} = 53.5\% = \frac{\text{Output}}{\text{Work}} = \frac{15,000}{28,000} \times 100$

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*
Work	30,000	13,000
Output	20,000	11,000

*Based on calculated mean amount of work (in number of trials) and output of 15 criminal courts in the State of Paradise during 1977 (excluding Chaos City).

a. $E_{Chaos} = \frac{\text{Output}}{\text{Work}} = \frac{20,000}{30,000} = 66.6\%$

$E_{State} = \frac{\text{Output}}{\text{Work}} = \frac{11,000}{13,000} - 84.6\%$

b. $E = \frac{66.6 - 84.6}{84.6} = -21.3\%$

Chaos' Trial Court in 1977 processed 21.3% less of its work than did the other 15 trial courts in the State.

WALK-THROUGH 'L'

F. Effectiveness

$$\text{Effectiveness} = \frac{\text{Output Measures}}{\text{Standard}}$$

1. Based on an objective of processing 24,000 cases, the court was 83.3% effective:

$$E_f = \frac{\text{20,000 Cases (Output)}}{\text{24,000 Cases (Planned Output)}} \times 100 = 83.3\%$$

2. Based on an objective of not increasing the backlog of 7,000 cases, the court was 42.8% ineffective:

$$E_f = \frac{\text{Output (Later Period) - Output (Earlier Period)}}{\text{Planned Output}} \times 100$$

$$E_f = \frac{\text{10,000 Case Backlog - 7,000 Case Backlog}}{\text{7,000 Case Backlog}} \times 100$$

$$E_f = 42.8\%$$

WALK-THROUGH 'L'

G. 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 judges X 1,800 Cases/Judge = 27,000 Cases

2. Assuming a productivity standard of $275/Case, a second measure of court capability would be 23,636 cases.

   $C_2 = R \div PS$ = $6,500,000 ÷ $275/Case = 23,636 Cases

3. Assuming a productivity standard of 1 Judge-Hour/Case, a third measure of capability would be 24,000 cases.

   $C_3 = R \div PS$ = 24,000 Judge-Hours ÷ 1 Judge-Hour/Case = 24,000 Cases

H. 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 (P_m). Assuming a maximum productivity of $210 per case, 30,952 cases could be processed.

$CAP = R \div P_m$ = $6,500,000 ÷ $210/Case = 30,952 Cases

WALK-THROUGH 'L'

I. Determining Resource Requirements Based on Fixed Productivity Standards

Step 1. The number of Judge-Hours (J-Hrs) required to meet existing work is 36,000 Judge-Hours.

$$R_1 = \text{Work} \times P_s = 30{,}000 \text{ cases} \times 1.2 \text{ J-Hrs/Case} = 36{,}000 \text{ J-Hrs}$$

Step 2. The total number of judges required to meet existing work is determined by converting Judge-Hours into Judges. Since there are 1,600 Judge-Hours/Judges Available the number of Judges required is 22.5 Judges.

$$R_2 = \frac{R_1}{R_2} = \frac{36{,}000 \text{ Judges-Hours}}{1{,}600 \text{ Judge-Hours/Judge}} = 22.5 \text{ Judges}$$

Step 3. Therefore, 7.5 additional judges are required to process all cases, assuming a productivity standard of 1.2 J-Hrs per case.

Step 4. This requires a resource increase of 50% in the number of Judges.

$$R_3 = R \frac{\text{(Required)} - R \text{ (Existing)}}{R \text{ (Existing)}} \times 100$$

$$R_3 = 22.5 - 15 \times 100 = 50\%$$

WALK-THROUGH 'L'

J. Determining Workload Requirements Assuming Fixed Resources

Step 1. The workload necessary to process all 30,000 cases is:

$$WL_1 = \frac{W}{R} = \frac{30{,}000 \text{ Cases}}{15 \text{ Judges}} = 2{,}000 \text{ Cases/Judge}$$

Step 2. Similarly, the workload necessary for each Judge to process 2,000 cases is:

$$WL_2 = \frac{R}{W} = \frac{1{,}600 \text{ Judge-Hours}}{2{,}000 \text{ Cases}} = .8 \text{ Judge-Hours/Case}$$

(48 Judge Min./Case)

Step 3. Accepting 48 Judge minutes per case as a productivity standard (P_s) would require a 50% increase in productivity.

Where: Productivity (P) equals 72 Judge minutes per case and productivity standard = 48 Judge minutes per case (see: Walk-Through "L", Data Set Worksheet, D. Productivity, 3).

$$\frac{P - P_s}{P_s} \times 100 = \frac{72-48}{48} \times 100 = 50\%$$

K. 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.

Table 2. Comparing Changes in Resources and Productivity and Resulting Court Backlog

Productivity Standard (PS) (Judge-Minutes/Case)	Resource (R) (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

$$\text{Backlog} = \text{Work} - \frac{\text{Resources}}{\text{Productivity Standard}}$$

*Existing Backlog (given 15 judges and 72 Judge-Minutes/Case) =

$$30{,}000 \text{ cases} - \frac{(15 \text{ judges} \times 96{,}000 \text{ Judge-Minutes/Year})}{72 \text{ Judge-Minutes/Case}} = 10{,}000 \text{ Cases}$$

**Estimated Backlog (given 17 Judges and 72 Judge-Minutes/Case) =

$$30{,}000 \text{ Cases} - \frac{(17 \text{ Judges} \times 96{,}000 \text{ Judge-Minutes/Year})}{72 \text{ Judge-Minutes/Case}} = 7{,}333 \text{ Cases}$$

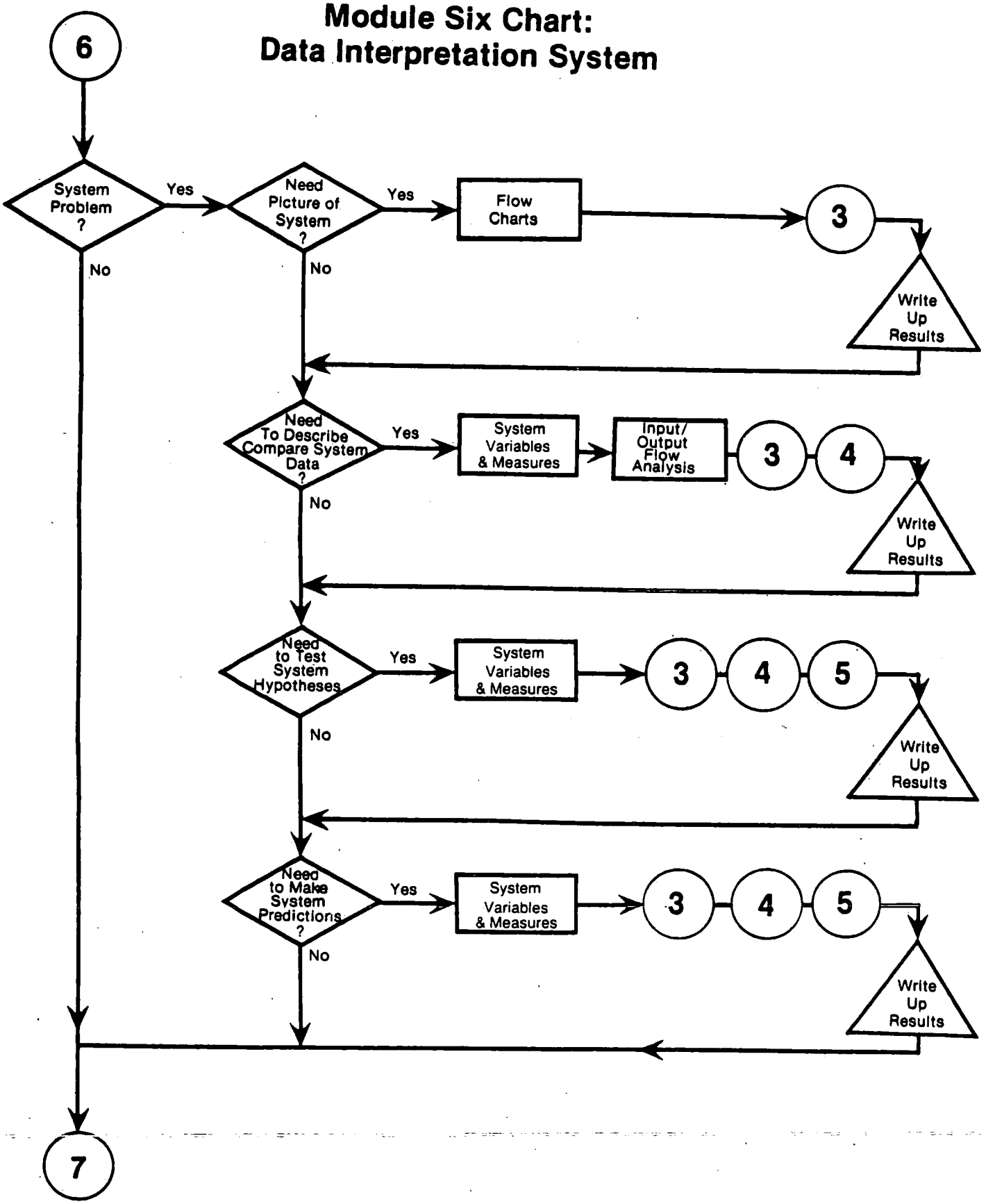
WALK-THROUGH 'L'

NOTES

V. CONCLUSION

A. Review the Module Chart.

SHOW V.A. (6-9):


Module Six Chart:
Data Interpretation System
6
System Problem ?
Yes
No
Need Picture of System ?
Yes
No
Flow Charts
3
Write Up Results
Need To Describe Compare System Data ?
Yes
No
System Variables & Measures
Input/ Output Flow Analysis
3
4
Write Up Results
Need to Test System Hypotheses
Yes
No
System Variables & Measures
3
4
5
Write Up Results
Need to Make System Predictions ?
Yes
No
System Variables & Measures
3
4
5
Write Up Results
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 written and oral presentations.

This module should last no longer than 60 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

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. Using good organization and appropriate content
   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

TOPIC	TIME	PAGE
I. CONSIDERATIONS IN PREPARING PRESENTATIONS	5 minutes	VII-3
A. Preparation	*	VII-3
B. Responsibilities	*	VII-3
C. Cautions	*	VII-3
D. Objectives	*	VII-4
E. Technical Checklist	*	VII-5
II. ACHIEVING PERSPECTIVE	10 minutes	VII-7
A. Role/Politicians	*	VII-7
B. Role/Citizens	*	VII-8
C. Role/Administrators	*	VII-9
D. Role/Analyst	*	VII-10
III. GUIDELINES FOR EFFECTIVE PRESENTATIONS	10 minutes	VII-10
A. Uses	*	VII-10
B. Guidelines	*	VII-11
C. Clarification/Interpretation	*	VII-12
D. Contrasts/Comparisons	*	VII-13
E. Illustrations/Examples	*	VII-13
F. Anticipate Questions	*	VII-14
G. Important Terms	*	VII-15
IV. PREPARING A WRITTEN REPORT	20 minutes	VII-15
A. Content	10	VII-15
B. Guides	*	VII-16
C. Organization	10	VII-17
V. CONDUCTING A BRIEFING	10 minutes	VII-18
A. Briefing Materials	*	VII-18
B. Manner	*	VII-18
C. Balanced Presentation	*	VII-20
VI. CONCLUSION	5 minutes	VII-21
A. Balance	*	VII-21
B. Review	*	VII-24
TOTAL TIME	60 minutes	

* 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. When presenting a report an analyst should assume ownership and be responsible for its contents.

3. The report should 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, the problems are usually 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 statement a sense of the "larger picture." You should not only address the concerns of the audience but also the related concerns and presumed causes identified by the analysis.

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. The presentation of complex technical information.

   b. Inadequate data/information.

   c. Inadequate tools.

   d. Limitations of time.

   e. 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)
    (3) Causality

+ The hypotheses should directly relate to concepts and should exhibit the characteristics identified in Module 2:

    (1) Measurable
    (2) Accurate
    (3) Testable
    (4) Importance

+ The set of hypotheses used should be comprehensive:

    (1) Magnitude
    (2) Rate of Change
    (3) Temporal Aspects
    (4) Seriousness
    (5) Persons Affected
    (6) Spatial Aspects
    (7) System Response

NOTES

+ 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--contained in the definition of Problem Statement in Module 1: A written document or oral presentation which comprehensively describes the nature, magnitude, seriousness, rate of change, persons affected, and spatial, and temporal aspects of a problem using qualitative and quantitative information. It identifies the nature, extent, and effect of system response; makes projections based on historical inferences, and rigorously attempts to establish the orgins of the problem.

II. ACHIEVING PERSPECTIVE

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 often work under a crisis mandate.

+ 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

- Concerned About Costs
- Want To Know Impact On Community
- Expect 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.

3. These quidelines are relevant to both written and oral presentations.

NOTES

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
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 or she 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.

C. Clarification and Interpretation

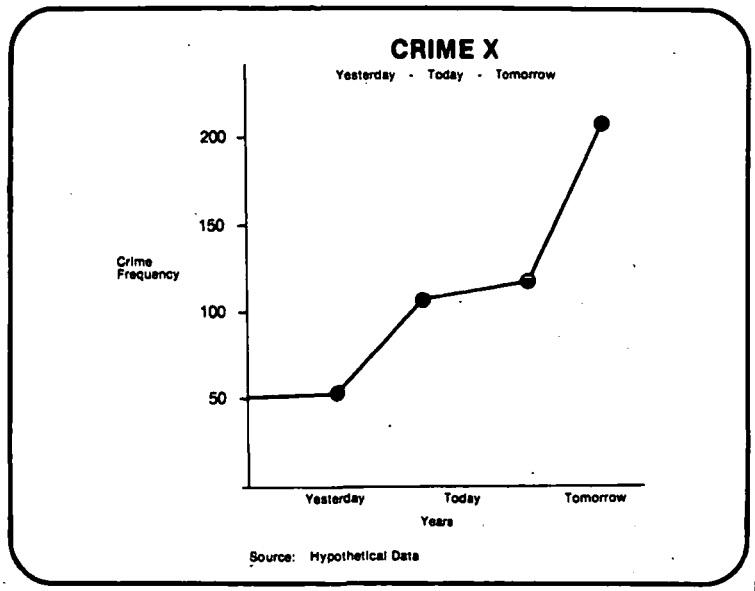
1. The audience should be aware at the end of a presentation what the problem actually means to them.

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.

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?

D. Use Contrasts and Comparisons

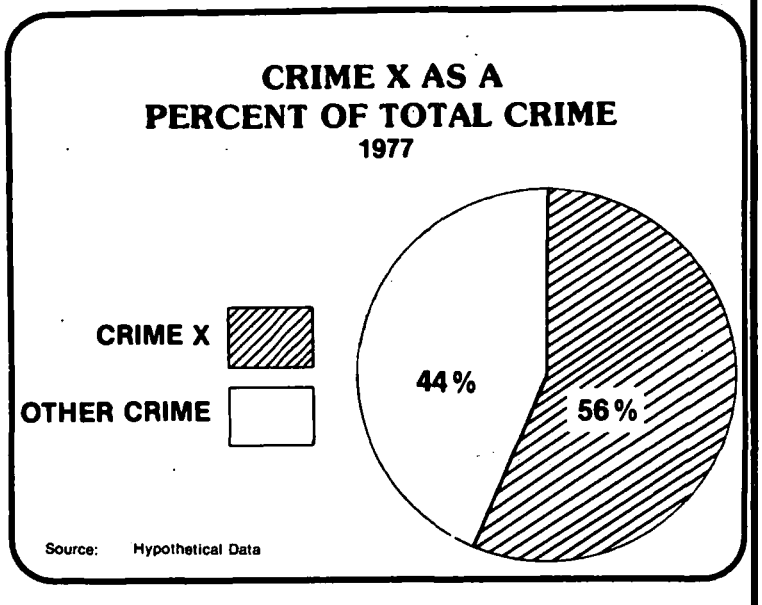
1. Reinforce the context of the presentation, by comparing the problem with knowledge the audience already has.

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.

+ 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.

F. Anticipate Questions and Issues

SHOW V.A. (7-9):

ANTICIPATE QUESTIONS AND ISSUES

- Identify Assumptions
- Develop Awareness
- Establish Credibility
- Prepare for Presentation

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.

+ Rehearsal and editing should be from the audience and reader's perspectives.

+ Plan responses to anticipated questions.

G. 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>: If possible this should be drawn from participants in class discussion:

Written Reports

1. Provide greater detail than oral reports.

2. Can supplement oral reports.

3. Are essential in situations where the analyst is unable to provide oral reports.

4. Can be broadly disseminated.

5. Provide necessary documentation for program development and evaluation.

<u>Note</u>: This information should be oriented toward assisting participants in preparing the required portfolio for the Major Exercise.

A. Content

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.

   a. Data are useful in focusing attention.

   b. Can be used to build confidence in the conclusions.

   c. Too much or poorly organized data can confuse the presentation and understanding.

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.

4. The presentation guidelines presented in Part III should be followed.

C. Written Report Organization.

SHOW V.A. (7-10):

WRITTEN REPORT ORGANIZATION

Section 1.0	**Introduction** 1.1 Statement of concerns 1.2 Nature and source of concerns 1.3 Scope of concerns
Section 2.0	**Analysis Methodology** 2.1 Definition of terms used 2.2 Measurement reliability and validity 2.3 Data Collection procedures used 2.4 Statistical Methods used
Section 3.0	**Findings** 3.1 Conceptual Hypothesis #1 — Supporting variable and measurement hypotheses, results, interpretations and conclusions 3.2 Conceptual Hypothesis #2 — Supporting variable and measurement hypotheses, results, interpretations and conclusions 3.3 Etc.
Section 4.0	**Discussion of findings in general** 4.1 Discussion of findings in relation to the concerns expressed 4.2 Discussion of limitations
Section 5.0	**Summary** 5.1 Highlights 5.2 Conclusions
Section 6.0	**Appendices**

EMPHASIZE (7-10):

+ Remind the participants that this is consistant with the organization of the problem statement used in Walk-Through B in Module 1.

+ Indicate that this is a suggested format, that attempts to structure the presentation in a logical order. The format is not as important as the logic of the organization.

+ The product of Task 4 of the Major Exercise is to use this format.

+ Priority messages should be in 5.1 (highlights).

+ Data reporting should not mask message or scare reader.

+ Tables and charts, unless used rigorously and sparingly, can be negative symbols.

+ The problem statement should include all appropriate information. In some instances full information may not be available or applicable. In other instances the audience may require an abbreviation or summarization of report sections. The analyst must above all else be aware of the audience to whom the problem statement is addressed and must emphasize the elements of special interest to that audience.

+ One of the biggest problems in providing information for decision-making is how to get decision-makers to deal with important details. Special formats such as an executive summary of the problem statement can be instrumental in building interest and directing attention to specific areas of the full report.

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. If more than one person will make the presentation, clearly specify individual responsibilities in the briefing, e.g., one person will cover Introduction, another Methodology, a third Findings, and possibly a fourth the Summary.

2. Speak to your audience, be direct, and know your own material.

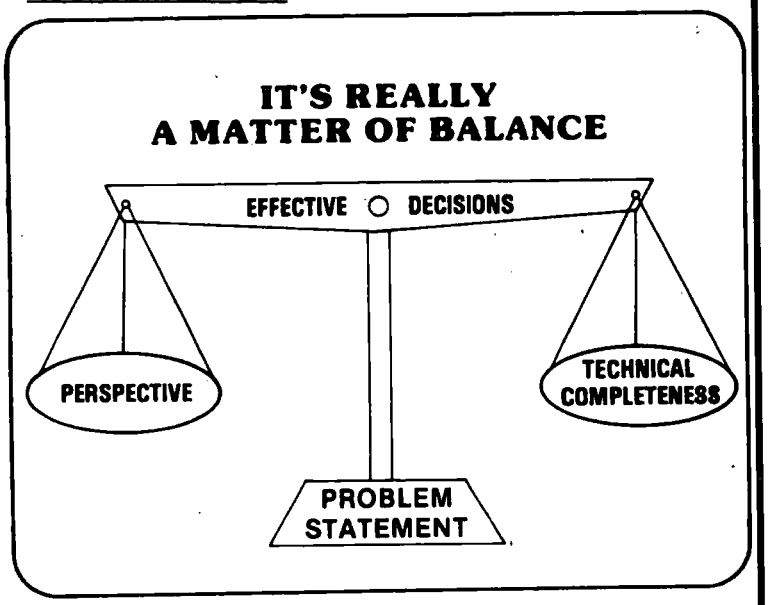
3. Face your audience and locate your visual aids in a manner so that they are easily read.

4. Avoid "loaded" words and negative symbols.

5. Be responsive to audience reactions and questions.

C. Provide a balanced presentation:

SHOW V.A. (7-11):



+ Problem specification, measurement and data interpretation, by themselves, are insufficient.

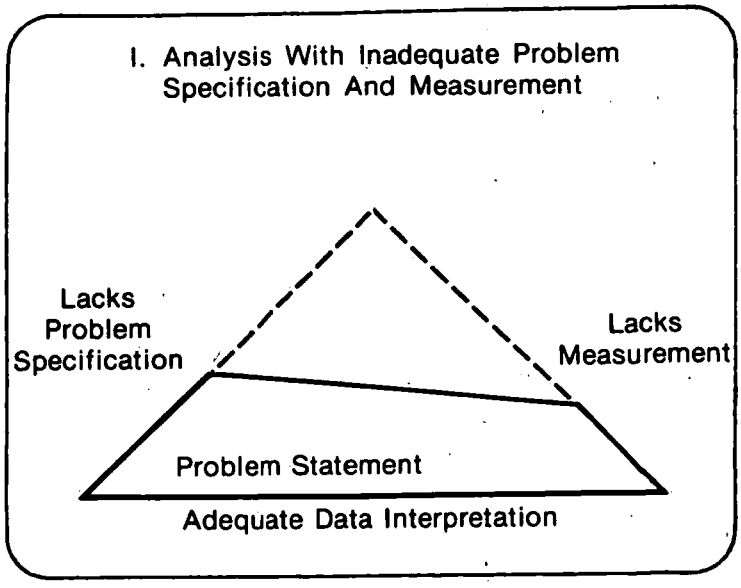
+ They must be refined and adjusted to the interests, concerns and perspectives of the audience.

VI. CONCLUSION

A. Finding Balance in Presentations: When well done, a problem statement, both written and orally presented, is a delicate balance among problem specification, measurement and data interpretation.

1. Analysis with Inadequate Problem Specification and Measurement.

SHOW V.A. (7-12):



EMPHASIZE (7-12):

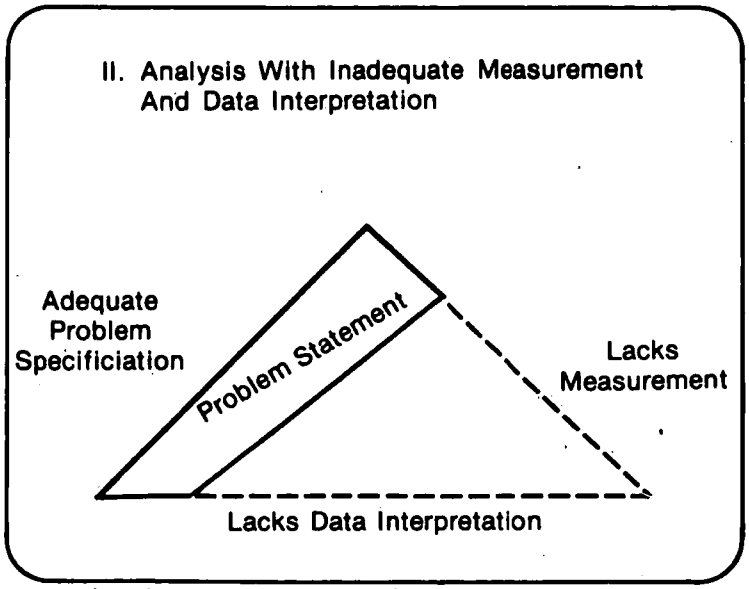
+ If too little emphasis is given to the conceptualization of the problem, the resulting hypotheses will suffer accordingly.

+ 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.

+ 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.

2. Analysis with Inadequate Measurement and Data Interpretation.

SHOW V.A. (7-13):



+ 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.

NOTES

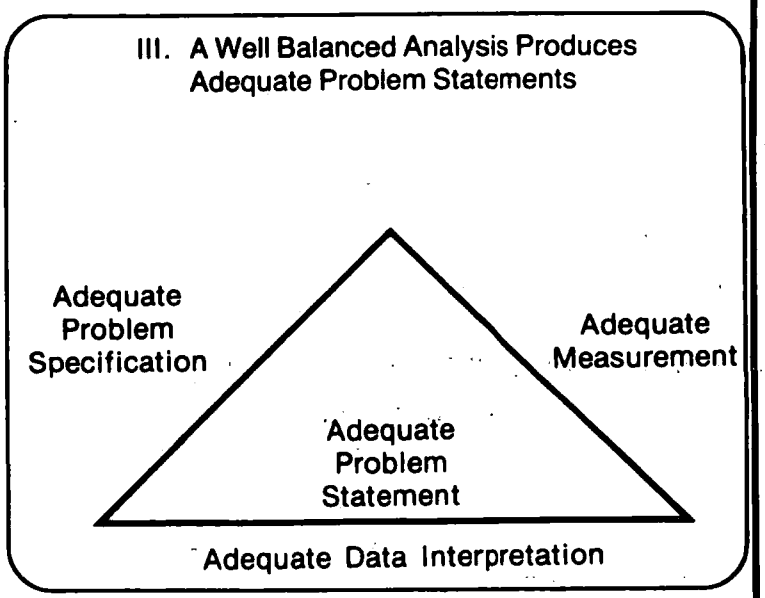
+ Example: The crime analyst responds to the patrol commander's concerns about performance by examining only the calls for police service on Friday and Saturday nights, disregarding the other days of the week. Or imagine if the analyst doesn't take into consideration seasonal fluctuations and the effects of climactic conditions on response time. Or, use of a statistical technique or graphic technique because the analyst is familar with the technique and fails to recognize situations in which the technique is inappropriate.

+ 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

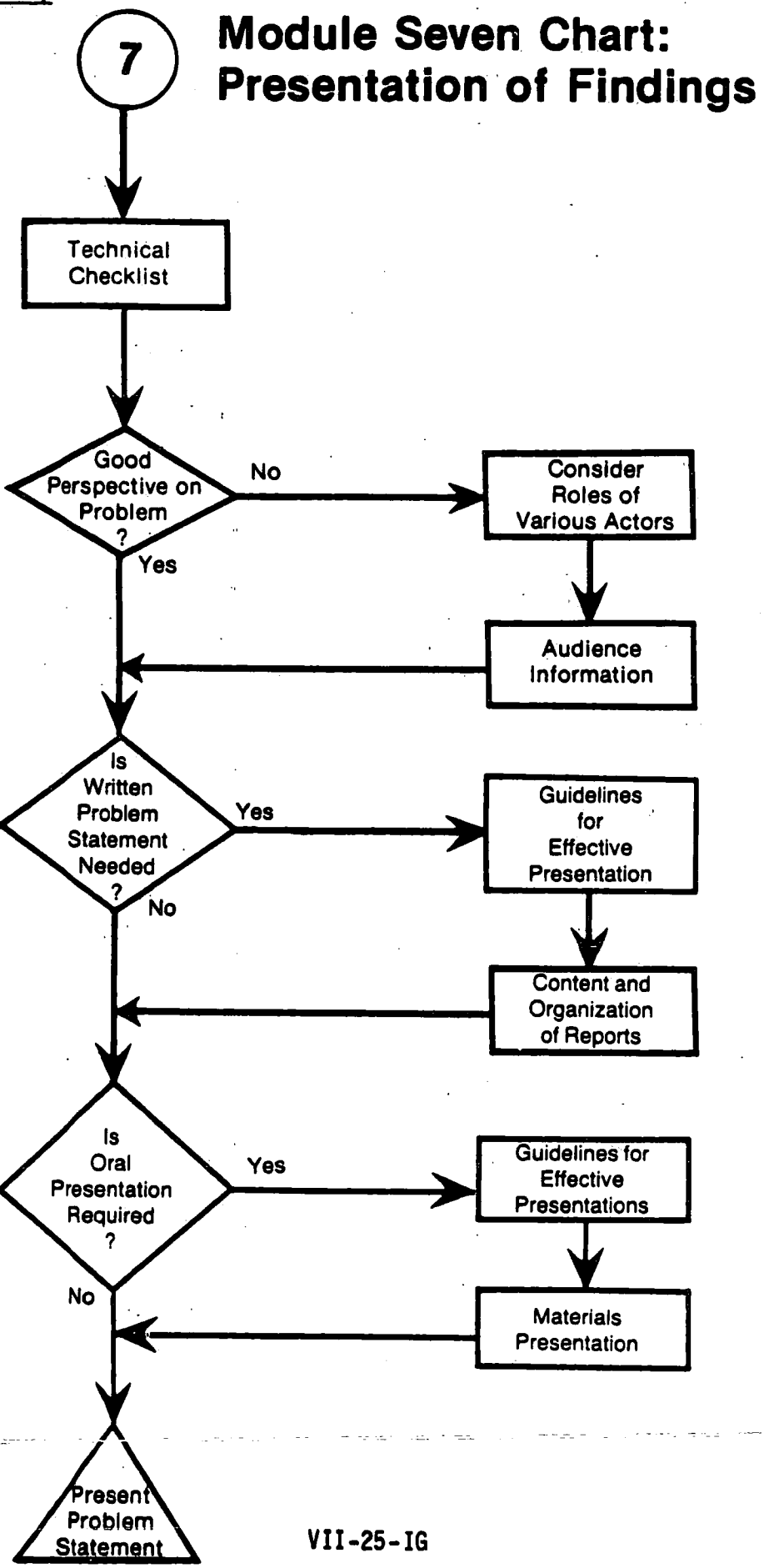
3. A Well Balanced Analysis Process Results in an Adequate Problem Statment.

SHOW V.A. (7-14):



B. Review the module chart.

SHOW V.A. (7-15):


7
Module Seven Chart:
Presentation of Findings
Technical Checklist
Good Perspective on Problem ?
No
Consider Roles of Various Actors
Yes
Audience Information
Is Written Problem Statement Needed ?
Yes
Guidelines for Effective Presentation
No
Content and Organization of Reports
Is Oral Presentation Required ?
Yes
Guidelines for Effective Presentations
No
Materials Presentation
Present Problem Statement

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 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.

C. The Major Exercise is a small-group activity.

1. Groups will be organized to achieve a balanced mixture of educational and experience levels within each group. Each group will be assisted by a facilitator who will provide occasional guidance and some assistance.

2. The nature of the exercise and, specifically the product requirements, necessitates that each group organize itself. Initially a group recorder will be required.

3. 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.

4. The nature of the exercise requires each group to assume a specific role and audience within the hypothetical Chaos City environment.

5. 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.

6. Do not waste time on inferences and assumptions where no basis of data or information exist in the materials you are provided.

7. Each Task has its own set of procedural instructions which follow the general form of the exercises in the course: I. Purpose, II. Instruments, III. Products and IV. Time.

8. The exercise is an analysis, not a plan to conduct an analysis. The plan for conducting your analysis is presented in Exhibit 1 and the instructions for the tasks.

MAJOR EXERCISE

D. The specific products required of each group are:

1. Completed worksheets

2. An outline of a completed problem statement.

3. An oral presentation

   - This presentation will be made to a review group (e.g., the class in plenary session; a criminal justice review board; a Mayor, Chief of Police, District Attorney, and supporting staff; or a technical review committee).

Major Exercise
Exhibit 1. Tasks and Schedule

TASK	ACTIVITY	TIME	DURATION	PRODUCT	PAGE
#1	Specify Problem	Monday p.m.	120 min.	Worksheets	5-8
#2	Assess Hypotheses	Monday p.m.	120 min.	Worksheets	9-14
Debriefing	Review Tasks #1 and #2	Tuesday p.m.	60 min.	Worksheets	15-16
#3	Data Interpretation	Thursday p.m.	120 min.	Worksheets	17-20
#4	Preparing Portfolio	Thursday p.m.	130 min.	Problem Statement Outline	21-27
Submit	Problem Statement Outline	Thursday p.m.		Problem Statement Outline	21-27
#5	Preparing Briefing	Friday a.m.	60 min.	Briefing Materials	28-30
#6	Presentations	Friday a.m./p.m.	180 min.	Formal Presentations	28-31

STAFF REPORTS	Page
Group A - Crime Prevention	33-35
Group B - Attrition Rate of Cases	36-38
Group C - Criminal Recidivism Among Adult Offenders	39-40

DATA SETS	Page
Group A - Crime Prevention	42-55
Group B - Attrition Rate of Cases	56-59
Group C - Criminal Recidivism Among Adult Offenders	60-65

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 which should be read and discussed by the group. The group should identify the concepts contained in the staff report. Also, other concepts the group feels are important but not mentioned in the report may be identified.

B. Prepare a list of variables for each concept.

C. Prepare a list of measures for each variable.

D. Use Worksheet A to record concepts, variables and measures. Worksheet B should be used to record your hypotheses.

E. Generate a set of hypotheses at the conceptual, varaiable and measurement levels using such terms as:

is greater than	is increased by	a change in
is less than	is decreased by	no change in
is related to	is equal to	an increase in
is unrelated to	is unequal to	a decrease in

F. Worksheet B should be used to record your 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.

III. PRODUCT

The group will provide a completed copy of Parts A and B worksheets to the group's facilitator at the conclusion of the task.

IV. TIME SCHEDULE - TASK #1

Review Staff Report	- 10 minutes
Discuss and List Concepts, Variables and Measures	- 30 minutes
Prepare Part A Worksheet	- 30 minutes
Prepare Part B Worksheet	- 30 minutes
Review Problem Specification	- 20 minutes
Total	120 minutes

V. 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.

4. Assign groups their respective Staff Report.

5. Indicate that the Worksheets used in Walk-Through A & B should be used as a reference.

B. The class should be informed that they should proceed with Task #2 at the appropriate time. The Facilitator should be sure that Task #1 is completed on time.

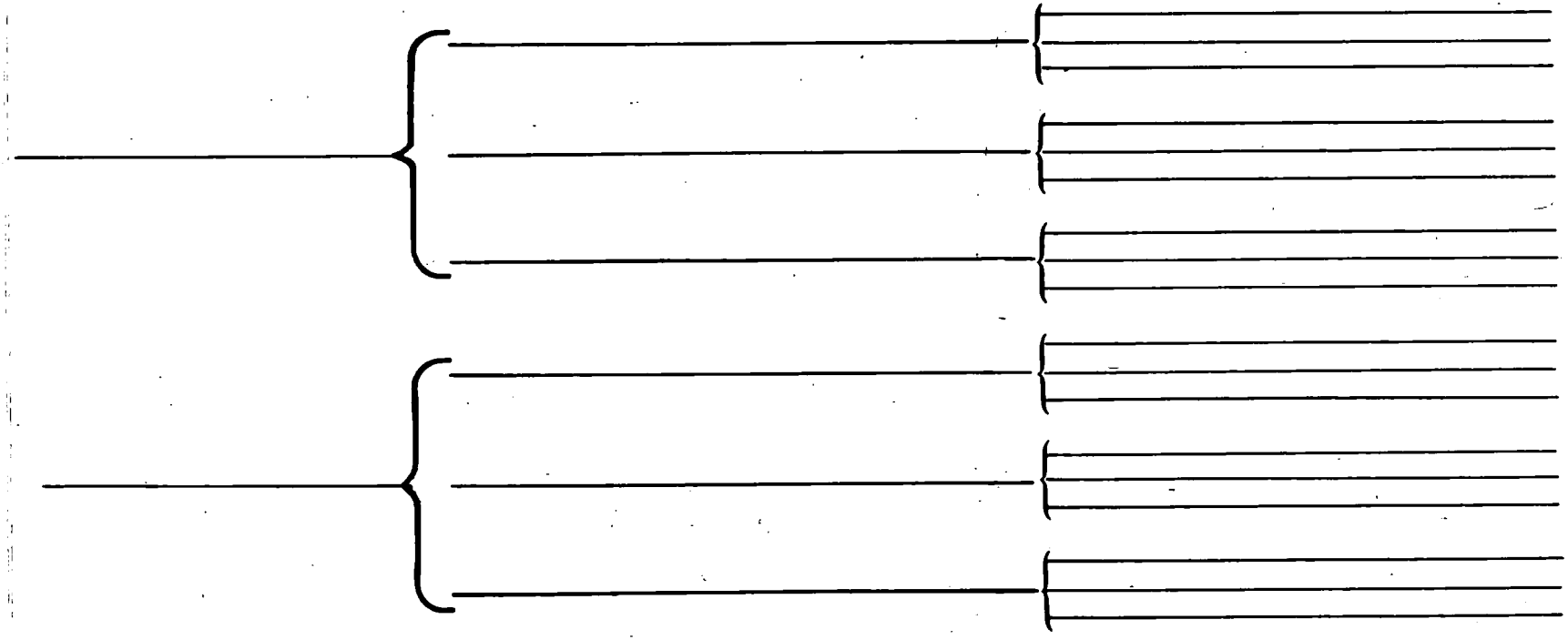
MAJOR EXERCISE: CHAOS CITY

TASK I: PROBLEM SPECIFICATION

PART A: ELABORATING CONCEPTS, VARIABLES & MEASURES

CONCERN:

CONCEPTS | VARIABLES | MEASURES



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 is designed to help you review and assess the completed problem specification from Task #1 in terms of the criteria discussed in Module II. The product of this task is a listing of hypotheses which will be tested in Task #3.

II. INSTRUCTIONS

A. For each hypothesis developed in Task #1 complete the Part A Worksheet by first listing the hypothesis, checking the availability of relevant data, and then noting the strengths and weaknesses of that hypothesis in terms of the four criteria listed on the form.

Consider both conceptual and technical sources of measurement error in the data which is most likely available. Comment in the appropriate box for each hypothesis whether these are significant factors impeding an understanding of data which might be collected. See the Worksheet supplement for considerations that may help in evaluating your hypotheses.

B. When all hypotheses have been evaluated, identify the best hypotheses which you propose to test.

C. List your best hypotheses on the Part B Worksheet. Assess each hypothesis by placing a check in the appropriate box(es) to indicate those elements of a problem statement it covers. Identify and discuss elements of the problem that are not addressed and determine whether additional hypotheses need to be generated.

III. PRODUCT

Copies of Worksheets A and B for Tasks #2 will be provided to the facilitator at conclusion of this task.

IV. TIME SCHEDULE - TASK #2

List Hypotheses and Review Data Set	-	20 min.
Assessing Hypotheses	-	40 min.
Assessing Comprehensiveness	-	20 min.
Consider Additional Hypotheses	-	20 min.
Discuss and Complete Group Worksheet	-	20 min.
Total		120 min.

MAJOR EXERCISE

V. INSTRUCTOR NOTES

A. Go over the Task #2 worksheets with the participants.

B. Briefly review the data set with the group. 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.

C. 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.

D. Legible and complete group worksheets are due at the end of the task.

E. 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. They must also adequately cover and describe the problem. Facilitators should cue groups during Part B of Task #2 to such hypotheses if not generated by the group discussion in the time provided. These additional hypotheses should be suggested by the characteristics listed in the worksheet. In making suggestions, their facilitator should work toward comprehensiveness and require the participants to define their problem specification and assessment of hypotheses.

F. Extra worksheets may be needed by the groups.

WORKSHEET SUPPLEMENT

Considerations of Measurement Error and Utility

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) Underestimation of "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. Is a census of the entire population or group taken or is a sample taken? Are sampling errors possible?

MAJOR EXERCISE

3. Testability.

   a. Are there statistical techniques available to assess the measures selected?

   b. Is the implied causal relationship in the hypothesis logical?

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

   a. Time

   b. Money

   c. Organizational Considerations

   d. Are the measures in each hypothesis subject to influence by the decision-maker?

   e. Does the hypothesis address weakness in the original staff report?

   f. Will interpretation of the hypothesis contribute to a better understanding of the problem?

      (1) 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.

      (2) 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.

MAJOR EXERCISE: CHAOS CITY

TASK 2: ASSESSING HYPOTHESES

PART A: EVALUATING & ASSESSING INDIVIDUAL HYPOTHESES

FROM TASK 1 SELECT UP TO TEN MEASUREMENT LEVEL HYPOTHESES TO BE ASSESSED:	DATA AVAIL.	MEASUREMENT ERROR		TESTABILITY	UTILITY OR IMPORTANCE	OVERALL ASSESSMENT
		CONCEPTUAL	TECHNICAL			

MAJOR EXERCISE: CHAOS CITY

TASK 2: ASSESSING HYPOTHESES

PART B: DETERMINING COMPREHENSIVENESS OF A SET OF HYPOTHESES

LIST HYPOTHESES THAT ARE ASSESSED USEFUL (RESTATE, IF NECESSARY)	INDICATE THE CHARACTERISTICS ADDRESSED BY HYPOTHESES							COMMENT
	MAGNITUDE	RATE OF CHANGE	TEMPORAL ASPECTS	SERIOUSNESS	PERSONS AFFECTED	SPATIAL ASPECTS	SYSTEM RESPONSE	
TOTAL BY TYPE OF CHARACTERISTICS								

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. In plenary session, the lead instructor should:

1. Explain where groups should be in the exercise by the end of the debriefing period.

2. Explain the debriefing process.

3. Briefly cover general problems identified in the review of group products.

4. Direct the groups to their break-out rooms for debriefing to be conducted by group facilitators.

D. The specific debriefing is to be conducted by the facilitator with the assistance of the instructor in the break out groups.

1. Sufficient copies of the Task #1 and #2 worksheets should be made and distributed at the beginning of the debriefing to participants.

2. Prepare on newsprint each group's final list of hypotheses. Post these in a location that all can see.

3. In commenting on the participants' work, focus on their strengths and weaknesses and solicit from the group comments on problems encountered in hypothesizing.

4. Be sure that the following are understood by the end of the debriefing:

a. That the problem area has been comprehensively covered by the hypotheses.

b. That the logic of the problem specification is clearly stated and understood.

c. That the remaining set of hypotheses form the basis for further analysis.

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.

III. TIME SCHEDULE - DEBRIEFING

Plenary Session	-	10 minutes
Group Debriefing	-	50 minutes
	TOTAL	60 minutes

MAJOR EXERCISE: CHAOS CITY

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 outline.

C. Part A Worksheet deals with the application of statistical methods in data interpretation.

1. The Worksheet provides a list of questions which guide interpretation. Space also is provided for responding to the questions.

2. Each hypothesis should be placed on a separate worksheet. Also for each hypothesis a null hypothesis is to be stated. These hypotheses should be specified at the measurement level.

3. The full range of methods for data analysis should be used when possible. For example, some data can be analyzed by both descriptive and inferential methods. Methods to be considered are:

   a) Descriptive--Central Tendency, Variation, and Graphics.

   b) Comparative--Rates and Index Numbers, Cross Tabulations and Scattergrams, and Flow Charts.

   c) Inferential--Chi Square test, Correlation Coefficient, Visual Estimation and Least Squares Regression

4. The module charts may be useful in selecting the appropriate methods for analyzing the data.

5. When appropriate a quickly sketched graphic should accompany the interpretation. This graphic can be made on a separate sheet or on back of Part A Worksheet. The purpose of this graphic is to quickly document an illustrative intrepretation that may be used later in drawing-up graphics to support the oral presentation.

6. The work should be divided among the group members. This depends upon the number of group members and the number of hypotheses. For example, one or two members may choose to complete a Part A Worksheet on a particular hypothesis.

MAJOR EXERCISE

D. After all Part A Worksheets are completed the group should use Part B Worksheet to discuss the implications of the collective findings in regard to the original concern.

1. The group is to indicate in the matrix which one of the categories from strongly agree to strongly disagree represents the group concensus about the evidential support for a hypothesis.

2. Next the group should discuss to what extent the evidence provides insight into the original concern.

III. PRODUCT

Copies of Worksheets A and B for Task #3 will be provided to the facilitator at the conclusion of this task.

IV. TIME SCHEDULE - TASK #3

Briefing for Task	-	10 minutes
Deciding Work Allocation for Part A	-	15 minutes
Performing Data Interpretation	-	60 minutes
Discussion of Relation of Findings to Concern	-	35 minutes
TOTAL		120 minutes

V. INSTRUCTOR NOTES

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 group should be encouraged to reach agreement quickly on who will perform the data interpretation for each hypothesis. Work allocation may be based on skill or familarity with analytic methods. Cursory inspection of the data may be needed before assignment so that members can identify which data they feel competent to analyze. 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.

MAJOR EXERCISE: CHAOS CITY

TASK #3 - PART A WORKSHEET
DATA INTERPRETATION

I. State the measurement level hypothesis:

Alternative Hypothesis:

Null Hypothesis:

II. Apply (if appropriate) descriptive methods to the data.

a. What are the findings?

b. Do the findings prove or disprove the null hypothesis?

III. Apply (if appropriate) comparative methods to data.

a. What are the findings?

b. Do the findings prove or disprove the null hypothesis?

IV. Apply (if appropriate) inferential methods to data.

a. What are the findings?

b. Do the findings prove or disprove the null hypothesis?

V. Attach hand-drawn graphic of this interpretation (if appropriate).

MAJOR EXERCISE: CHAOS CITY

TASK #3 - PART B WORKSHEET
RELATION OF FINDING TO CONCERN

I. The evidence strongly supports the hypotheses:

Hypothesis	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.					
2.					
3.					
4.					
5.					
6.					

II. Summarize the implications of these findings to the original concern.

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

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.

This task provides the participant an opportunity to develop an outline of the Problem Statement that utilizes the presentation guidelines suggested in Module 7. This presentation should be well organized, 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 Problem Statement outline (tables, charts or graphs not included in page count). An example Problem Statement outline in the following pages can be used as a guide in preparation of your problem statement outline.

C. Edit the portfolio and finalize its content.

D. The portfolio is to be completed and submitted by Thursday evening.

III. TIME SCHEDULE TASK #4

Briefing for Task #4	- 10 minutes
Clean-up Tasks #1 - #3 Worksheets	- 20 minutes
Identify Priority Messages and Supporting Information	- 20 minutes
Prepare Problem Statement Outline	- 60 minutes
Review Portfolio	- 20 minutes
Total	130 minutes

MAJOR EXERCISE

VI. INSTRUCTOR NOTES

A. In preparing the groups for Task #4, the facilitator should:

1. Go over in detail the final products expected. Indicate the cover sheet should be completed by the group.

2. Identify the membership of the review group (e.g., the class in plenary session; a criminal justice review board: a Mayor, Chief of Police, Judge, District Attorney, and supporting staff; or a technical review committee.)

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.

MAJOR EXERCISE: CHAOS CITY

EXAMPLE PROBLEM STATEMENT OUTLINE: Motor Vehicle Theft in Chaos City

1.0 Introduction

1.1 Statement of Concerns
- a. Complaints by businessmen.
- b. Possible curtailment of shopper trade because of fear.

1.2 Nature and Source of Concerns
- a. Businessman's complaint not founded on data.
- b. Businessman's perception may be reinforced by some customers complaints.

1.3 Scope of Concerns
- a. Businessmen have communicated among themselves and to the news.
- b. The businessmen's perception could affect shopper's selection of store location.
- c. Mayor has to respond to businessmen.

2.0 Analysis Methodology

2.1 Definition of Terms Used
- a. Unauthorized use.
- b. Differences in types of motor vehicles.

2.2 Measurement Reliability and Validity
- a. Over 90% reported.
- b. Rates vary by location.
- c. Risk per 1,000 registered vehicles by location substantiated by frequency measurements.

2.3 Data Collection Procedures
- a. 1 year study.
- b. Random sample of 20% of reports.

2.4 Statistical methods used
- a. Methods of measurement.
  - -frequency.
  - -rate per 1,000 persons.
  - -rate per 1,000 opportunity.
- b. Correlational analysis.
- c. Chi square.

3.0 Findings

3.1 Magnitude
- a. Hypothesis: Motor vehicle theft in Chaos City is no different than in similar size cities.
- b. Found: Number in Chaos City is about 500 less than the average for similar size cities.

3.2 System Response
- a. Hypothesis: Clearance rate for Chaos City expected to be the same as the national average.
- b. Found: The clearance rate for Chaos City was lower by 10 percent from the 20 percent national average.

MAJOR EXERCISE

3.3 Seriousness
- a. Hypothesis 1: Auto theft was expected to be less serious than other property crimes in Chaos City.
- b. Found: Net dollar loss of auto theft was less than for burglary and recovery rate was better for auto theft.
- c. Hypothesis 2: Chaos City's recovery rate for stolen cars is no different than the national average.
- d. Found: Recovery rate in Chaos City is substantially better than national average.

3.4 Where Autos are Stolen
- a. Hypothesis 1: Magnitude varies by geographic area.
- b. Found: Three of the city's areas have risks relatively higher than other areas.
- c. Hypothesis 2: Magnitude varies by type of parking environment.
- d. Found: Parking lots and garages account for most thefts.

3.5 Auto Thefts are Deterred by Reducing Opportunities to Steal
- a. Hypothesis 1: Autos are stolen because keys are left in the ignition.
- b. Found: Victim reporting indicates only 1 in 20 stolen cars were left with key in ignition and that 43 percent were left unlocked.
- c. Hypothesis 2: Locking cars deters theft.
- d. Found: Half of all cars stolen were locked.
- e. Found: Cars with interlock ignition systems are stolen less often than cars without this system.

3.6 Charactertistics of Motor Vehicle Theft May Vary by Type of Vehicle
- a. Hypothesis 1: Truck theft is similar to auto theft in location of occurrence.
- b. Found: Trucks are taken more frequently from parking lots and garages but less often near residences than cars.
- c. Hypothesis 2: Truck theft is similar to auto theft in clearance rate.
- d. Found: Similarity of rates.
- e. Hypothesis 3: Motorcycle theft is similar to auto theft in location of occurrence.
- f. Found: Only one-third of thefts occur from garages and one-third from near victim's residence.
- g. Hypothesis 4: Motorcycle theft is similar to auto theft in clearance rate.
- h. Found: Clearance rate is much lower.

3.7 Most Suspects are Amateur Thieves
- a. Hypothesis: Most suspects of vehicle theft are amateur thieves.
- b. Found: Only 10% of cases are cleared by arrest.
- c. Found: Theft does not result in stripping of auto for sale.

3.8 Most Suspects are Young
- a. Hypothesis: The majority of all suspects are less than 21 years old.
- b. Found: Only 12 % of cases studied had known offenders.
- c. Found: 62% of suspects were less than 21.
- d. Found: 95 to 98% of all arrests are of persons less than 21 years of age.
- e. Found: 76% of all persons arrested had prior record.

4.0 Discussion

4.1 Discussion of Findings in Relation to Concerns.
- a. Auto thefts tend to occur more often in downtown area than in other areas.
- b. Unknown if the problem in downtown Chaos City differs from downtown areas in other cities.
- c. The recovery rate suggests that auto theft involves only a moderate expense to the community.

4.2 Limitations
- a. Cannot determine if frequency of vehicle thefts has changed over time.
- b. Cannot evaluate magnitude of downtown vehicle theft problem in relation to business sectors in similar size cities.
- c. Suspect information does not permit development of an offender profile.
- d. Public perception of auto theft has not been assessed.

5.0 Summary

5.1 Highlights
- a. Magnitude - bulk of problem.
- b. Victimization - reporting and risk.
- c. Location.
- d. Locking cars.
- e. Recovery and clearance rates.
- f. Truck and motorcycle thefts.
- g. Offender profile.

5.2 Conclusions
- a. Motor vehicle theft is not a major problem.
- b. Downtown and two other areas disportionately share city's motor vehicle theft problem.
- c. General sites of parking garages and lots could be possible focus of crime reduction efforts.
- d. Implication of recovery and clearance rates and possible juvenile involvement for preventive measures.
- e. Analysis could not identify factors affecting businessmen's perceptions of motor vehicle theft.

MAJOR EXERCISE: CHAOS CITY

TASK #4 -- COVERSHEET

TITLE: _____

_____

_____

_____

FINAL REPORT

GROUP: _____

CONTENTS

Task #1 Worksheets
Task #2 Worksheets
Task #3 Worksheets
Problem Statement Outline

PREPARED BY:

_____

_____

_____

_____

_____

_____

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

TASK #4 - CRITIQUE CRITERIA

1. Is the problem clearly and accurately stated?
2. Are the hypotheses comprehensive?
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 outline properly emphasize the information?
7. Is the problem statement easy to understand?

MAJOR EXERCISE: CHAOS CITY

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.

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 discuss and identify 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 four 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. In conducting the debriefing be sure to allow the class to ask questions, make comments and react.

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 CRITERIA

1. Is the presentation well organized and focused?
2. Were the interests and concerns of the audience addressed?
3. How effectively are visual aids used?
4. How responsive and prepared is the presentor(s) to questions?

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY

TASK #6 - CRITIQUE FORM

INSTRUCTIONS: Rate each of the categories in Parts I and II on a one to ten scale. A fair rating would lie in the range of 1-3, 4-7 (good), 8-10 (excellent). A subtotal for each part, as well as an overall total, can be calculated. The comments section should be used to support the ratings and document other observations.

PART I: FINAL WRITTEN REPORT OUTLINE	SCORE
1. Is the problem clearly and accurately stated?	
2. Are the hypotheses comprehensive?	
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 outline properly emphasize the information?	
7. Is the problem statement easy to understand?	
MAXIMUM POSSIBLE SCORE: 70 PTS Sub-Total	
PART II: PRESENTATION	
8. How effectively are visual aids used?	
9. Were the interests and concerns of the audience addressed?	
10. Is the presentation well organized and focused?	
11. How responsive and prepared is the presentor(s) to questions?	
MAXIMUM POSSIBLE SCORE: 40 PTS. Sub-Total	
MAXIMUM POSSIBLE SCORE: 110 PTS Total	

Comments: _____

MAJOR EXERCISE

MAJOR EXERCISE-STAFF REPORTS

	PAGE
GROUP A - Crime Prevention	33-35
GROUP B - Attrition Rate of Cases	36-38
GROUP C - Criminal Recidivism Among Adult Offenders	39-40

MAJOR EXERCISE

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 Reported Crime Data, 1977

TYPE OF CRIME	NEIGHBORHOOD					TOTAL REPORTED
	CENTRAL	WESTSIDE	UNIVERSITY	PARK	WASHINGTON	
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	4500	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

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.

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

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%

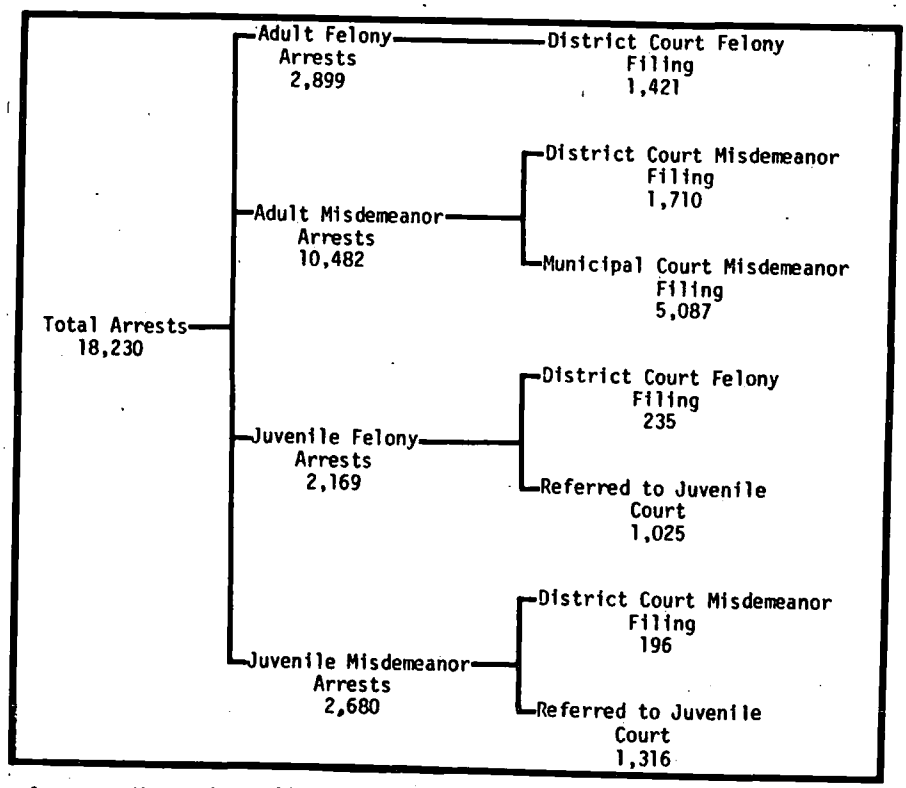
* May not add to 100% due to rounding n = 1500
Source: Paradise University, Survey Research Center, 1978.

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 felony cases. Of a total of 2,899 adults arrested for a felony there were 1,421 felony 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



Source: Chaos City Police Dept., 1978

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 46% of the cases which the DA refused to prosecute, the quality of case preparation by the investigator or the arresting officer may represent a legitimate problem area. (See Table 2.)

Table 2. Reasons for DA Case Refusal, 1977

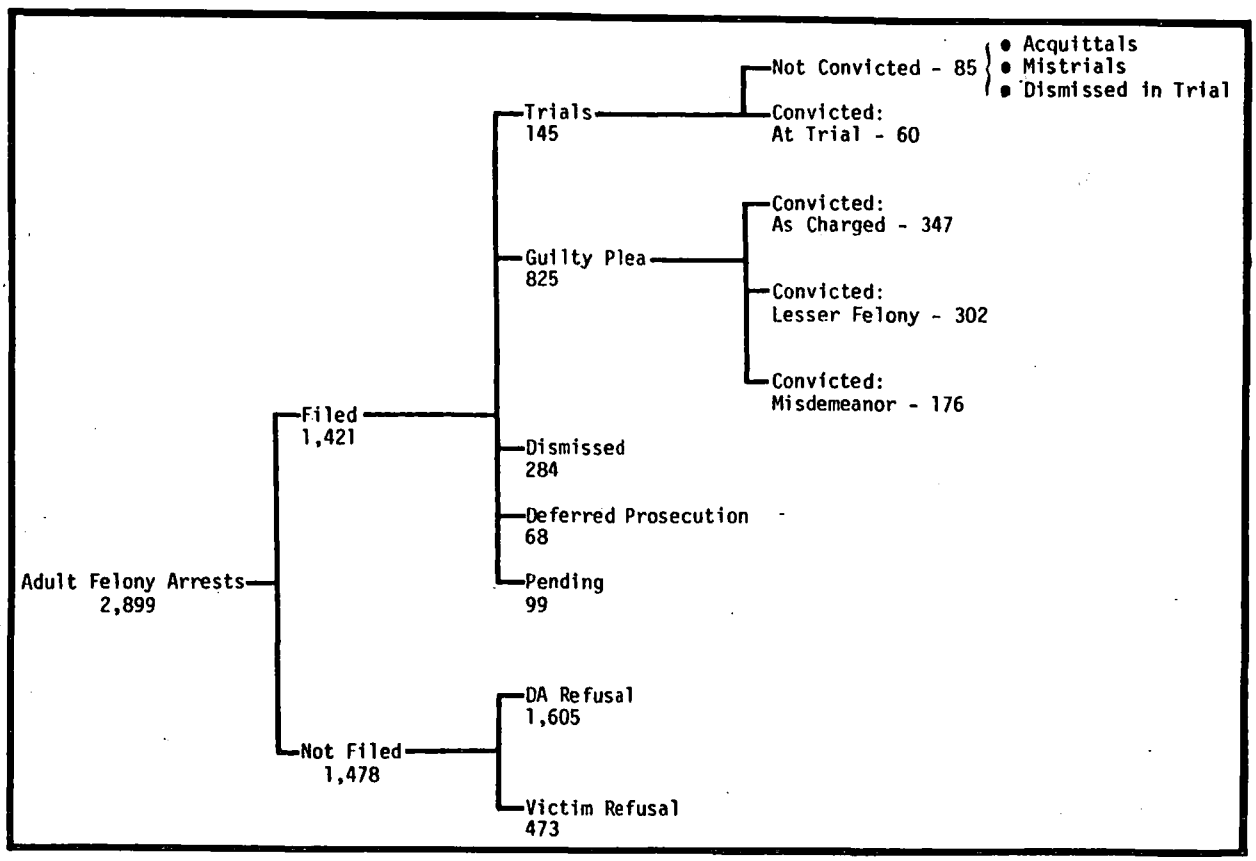
Reason for Refusal	N	%
Evidence Problem		
Inadmissable evidence	252	25
Unavailable physical evidence	50	5
Insufficient physical evidence	161	16
Total	463	46%
Witness Problem		
Unable to locate	40	4
Related/friend of offender	30	3
Witness story/credibility	70	7
Reluctant to get involved w/system	30	3
Total	170	17%
Prosecutorial Merit		
Multi-case disposition	60	6
Office policy	30	3
Diversion program	242	24
Total	332	33%
Unknown	40	4
TOTAL	1005	100%

Source: Chaos City District Attorney's Office, 1978.

MAJOR EXERCISE

What is even more disturbing than the number of cases dropped is the disposition of cases adult felony after filing. Only 10% of the felony filings in 1977 were actually tried. About two times more cases were dismissed than tried. Of those tried only 41% were convicted, that is 60 persons out of 145 were convicted. In the consideration of the total number of convictions, guilty pleas accounted for 93% of all convictions and trial convictions only accounted for 7%. (See Table 3) A total of 885 convictions and guilty pleas out of over 1421 filings represents only a 62% conviction rate.

Table 3. Chaos City Arrests, Felony Filings and Case Dispositions, 1977



Source: Chaos City OBTS System, 1978

MAJOR EXERCISE

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.)

MAJOR EXERCISE

Table 2. Influence of Pre-Sentence Report on Rearrests, 1977

Offender Status	Pre-Sentence Report			Total
	Not Followed	Influenced	Closely Followed	
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

MAJOR EXERCISE
DATA SET

		PAGE
GROUP A	TABLES A-1 to A-11	42-55
GROUP B	TABLES B-1 to B-5	56-59
GROUP C	TABLES C-1 to C-4	60-65

MAJOR EXERCISE: CHAOS CITY
(GROUP A)

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
65-over	38,500	12

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

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.

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

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.

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%

MAJOR EXERCISE

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%	17%	18%	15%
Door w/ key	2%	4%	13%	6%
Total	20%	28%	36%	36%
Forced				
Window	34%	28%	23%	20%
Door	46%	44%	41%	44%
Total	80%	72%	64%	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

MAJOR EXERCISE

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)

MAJOR EXERCISE

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

Table A-8. - Continued

INJURY LEVEL	#	%
None	391	64
Injury-no hospitalization	186	31
Injury with hospitalization	23	4

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: CHAOS CITY
(GROUP A)

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)

MAJOR EXERCISE

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

MAJOR EXERCISE

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)

MAJOR EXERCISE

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)

MAJOR EXERCISE

B. Attrition Rate of Cases in Chaos City

Table B-1. Chaos City, Adult Felony Case Processing Statistics

	1973	1974	1975	1976	1977
Adult Felony Arrests	1423	2089	2569	2609	2899
Filed	968	1253	1387	1291	1421
Trials	125	144	166	116	145
Trial Convictions	54	72	78	50	60
Guilty Plea	565	711	807	803	825
As Charged	241	290	340	340	347
Lessor Felony	183	212	260	280	302
Misdemeanor	141	209	207	183	176
Court Dismissals	182	270	273	223	284
Deferred Prosecutions	31	48	46	61	68
Cases Pending	65	80	95	88	99
Not Filed	455	836	1182	1318	1478
DA Refusal	278	668	827	817	1005
Victim Refusal	177	168	355	501	473

Source: Chaos City OBTS System, 1978. (Includes homicides, rape, burglary, assault and theft)

MAJOR EXERCISE

Table B-2. Chaos City Arrests, Felony Filings and Case Dispositions, Violent and Property Crimes, 1977.

	VIOLENT	PROPERTY
Adults Felony Arrests	725	2174
Filed	463	958
Trials	94	51
Trial Convictions	36	24
Guilty Plea	205	620
As Charged	65	282
Lesser Charge	85	217
Misdemeanor	55	121
Court Dismissals	114	170
Deferred Prosecutions	17	51
Cases Pending	38	61
Not Filed	262	1216
DA Refusal	102	903
Victim Refusal	160	313

Source: Chaos City OBTS System, 1978

Table B-3. 1977 UCR Disposition Data

	VIOLENT	PROPERTY	BOTH
Adults Charged	36,725	132,651	169,376
Guilty - As Charged	17,191	92,190	109,381
Guilty - Lesser Charge	4,497	9,811	14,308
Acquitted or Dismissed	15,037	30,650	45,687

Source: FBI, UCR, 1978. (Based upon 2566 cities - 1977 estimated population 37 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	43	15	252	25
Unavailable physical evidence	13	5	50	5
Insufficient physical evidence	38	14	161	16
Total	94	34	463	46
Witness Problem				
Unable to locate	8	3	40	4
Related/Friend of offender	10	4	30	3
Witness story/Credibility	48	17	70	7
Reluctant to get involved w/system	15	5	30	3
Total	81	29	170	17
Prosecutorial Merit				
Multi-case disposition	22	8	60	6
Office policy	19	7	30	3
Diversion program	34	12	242	24
Total	75	27	332	33
Unknown	28	10	40	4
Total	278	100%	1005	100%

Source: Chaos City District Attorney's Office 1978.

MAJOR EXERCISE

Table B-5. Chaos City Criminal Justice System Staffing

	1973	1974	1975	1976	1977
District Attorneys (Staff Attorneys)	8	9	10	11	11
Judges	15	15	20	20	20
Police Officers (Uniformed Offiers)	386	386	396	400	420

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
Assault	40	10 (25%)	30 (75%)	6 (15%)
Rape	25	4 (16%)	21 (84%)	4 (16%)
Robbery	61	32 (52.5%)	29 (47.5%)	17 (27.9%)
Burglary	75	44 (58.7%)	31 (41.3%)	25 (33.3%)
Theft	49	30 (61.2%)	19 (38.8%)	22 (44.9%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Number of Prior Felony Arrests (Not including that which resulted in original commitment)	Number of Cases	Rearrested	Not Rearrested	Reconvicted
None or None Known	85	31 (36.5%)	54 (63.5%)	15 (17.6%)
One	72	32 (44.4%)	40 (55.6%)	18 (25%)
Two	41	23 (56.1%)	18 (43.9%)	14 (34.1%)
Three	23	15 (65.2%)	8 (34.8%)	9 (39.1%)
Four	13	9 (69.2%)	4 (30.8%)	8 (61.5%)
Five	7	4 (57.1%)	3 (42.9%)	4 (57.1%)
Six or More	9	6 (66.7%)	3 (33.3%)	6 (66.7%)
Total	250	120 (48%)	130 (53%)	74 (29.6%)

Table C-1. Continued

History of Substance Abuse	Number of Cases	Rearrested	Not Rearrested	Reconvicted
Alcohol Abuse History	75	34 (45.3%)	41 (54.7%)	24 (32%)
Drug Abuse History	55	27 (49.1%)	28 (50.9%)	18 (32.7%)
Combination	23	13 (56.5%)	10 (43.5%)	10 (43.5%)
None	97	46 (47.4%)	51 (52.6%)	22 (22.7%)
Totals	250	120 (48%)	130 (52%)	74 (29.6%)

Post-Release Employment Status (2 months after release)	Number of cases	Rearrested	Not Rearrested	Reconvicted
Employed Part-time	43	20 (46.5%)	23 (53.5%)	12 (27.9%)
Employed Full-time	142	57 (40.1%)	85 (59.9%)	31 (21.8%)
Unemployed	65	43 (66.1%)	22 (33.9%)	31 (47.7%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Total number of jobs during 2-year follow-up	Number of Cases	Rearrested	Not Rearrested	Reconvicted
None	42	28 (66.7%)	14 (33.3%)	18 (42.9%)
One	83	29 (34.9%)	54 (65.1%)	17 (20.5%)
Two	71	34 (47.9%)	37 (52.1%)	21 (29.6%)
Three or more	54	29 (53.7%)	25 (46.3%)	18 (33.3%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Table C-1. Continued

Average Annual Income Level During Followup Period	Number of Cases	Rearrested	Not Rearrested	Reconvicted
$2,000	45	23 (51.1%)	22 (48.9%)	14 (31.1%)
$2,001 - $4,000	91	45 (49.5%)	46 (50.5%)	27 (29.7%)
$4,001 - $6,000	59	29 (49.2%)	30 (50.8%)	18 (30.5%)
$6,001 - $8,000	31	14 (45.2%)	17 (54.8%)	8 (25.8%)
$8,001 - $10,000	20	9 (45.0%)	11 (55.0%)	7 (35.0%)
$10,000	4	0 (0%)	4 (100%)	0 (0%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Number of known Residences During Followup Period	Number of Cases	Rearrested	Not Rearrested	Reconvicted
One	87	35 (40.2%)	52 (59.8%)	23 (26.4%)
Two	91	42 (46.2%)	49 (53.8%)	27 (29.7%)
Three	49	26 (53.1%)	23 (46.9%)	17 (34.7%)
Four or More	23	17 (73.9%)	6 (26.1%)	7 (30.4%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Table C-1. Continued

Sex and Ethnic Background	Number of Cases	Rearrested	Not Rearrested	Reconvicted
White Male	94	47 (50%)	47 (50%)	30 (31.9%)
Other Male	61	34 (55.7%)	27 (44.3%)	20 (32.8%)
White Female	63	24 (38.1%)	39 (61.9%)	16 (25.4%)
Other Female	32	15 (46.9%)	17 (53.1%)	8 (25%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Age	Number of Cases	Rearrested	Not Rearrested	Reconvicted
18 - 21	62	37 (59.7%)	25 (40.3%)	22 (35.5%)
22 - 25	49	29 (59.2%)	20 (40.8%)	17 (34.7%)
26 - 29	31	16 (51.6%)	15 (48.4%)	11 (35.5%)
30 - 33	33	22 (66.7%)	11 (33.3%)	11 (33.3%)
34 - 37	20	6 (30%)	14 (70%)	5 (25%)
38 - 41	36	8 (22.2%)	28 (77.8%)	6 (16.7%)
Over 42	19	2 (10.5%)	17 (89.5)	2 (10.5%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Type of Sentence Received Under Previous Offense	Number of Cases	Rearrested	Not Rearrested	Reconvicted
Probation	72	25 (34.7%)	47 (65.3%)	17 (23.6%)
Less Than One Year	123	61 (49.6%)	62 (50.4)	37 (30.1%)
Greater Than One Year	55	34 (61.8%)	21 (38.2%)	20 (36.4%)
Total	250	120 (48%)	130 (52%)	74 (29.6%)

Source: Paradise University, Criminal Justice Research Center, 1978

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	Assault	Rape	Robbery	Burglary	Theft
Rape	1	1	----	2	1
Robbery	5	1	55	2	6
Assault	2	2	7	1	8
Burglary	----	4	20	81	19
Felony Theft	9	----	3	13	59
Misdemeanor	2	1	2	11	5
Victimless	----	----	----	1	----
Total Rearrests*	19	9	87	111	98
Total Original Cases	N = 40	N = 25	N = 61	N = 75	N = 49

*The number of rearrests is greater than 120 since the average recidivist is rearrested 2.7 times.

Source: See Table C-1.

MAJOR EXERCISE

Table C-4. Chaos City Felony Arrest Statistics

Number of Prior Adult Arrests	1973		1974		1975		1976		1977	
	#	%	#	%	#	%	#	%	#	%
0	726	51%	1002	48%	1156	45%	1096	42%	1160	40%
1	313	22%	397	19%	437	17%	391	15%	464	16%
2	157	11%	251	12%	308	12%	261	10%	406	14%
3	85	6%	167	8%	206	8%	130	5%	145	5%
4	71	5%	84	4%	128	5%	287	11%	174	6%
5	43	3%	104	5%	180	7%	235	9%	290	10%
6+	28	2%	84	4%	154	6%	209	8%	260	9%
Total	1423	100%	2089	100%	2569	100%	2609	100%	2899	100%

Note: This table reflects the distribution of all felony arrests for the years from 1973 through 1977.

Source: Chaos City OBTS System, 1978. (Includes homicides, rape, burglarly, assault and theft)

MAJOR EXERCISE