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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:

Participant Guide

79356

JCEPN

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FOREWARD

THE CRIMINAL JUSTICE TRAINING CENTERS

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

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

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

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

THE CRIMINAL JUSTICE ANALYSIS COURSE

Background

The training course in Analysis of Crime and the Criminal Justice System was originally designed and developed by Abt Associates, Inc., Cambridge, Massachusetts, to help support the proposed High Crime Area Program. While this program was not implemented, the need for this type of training for criminal justice planners and analysts remained critical. The Analysis training was presented five times at the State University of New York at Albany (SUNY). A comprehensive evaluation of those deliveries identified some areas requiring revision.

A Task Order for the revision of the curriculum for training in the Analysis of Crime and the Criminal Justice System Course was issued to Abt Associates, February 2, 1977, under contract number J-LEAA-001-77. This revision was completed and delivered to the Law Enforcement Assistance Administration, August 15, 1977. This product was pilot tested by the Criminal Justice Training Center at the University of Southern California in January, 1978, and subsequently delivered several times by the training center system between January and June, 1978.

In June, 1978, LEAA and the five Criminal Justice Training Centers agreed that a "Finalization" of the original analysis course was appropriate. The Criminal Justice Training Center at Washburn University received a grant from LEAA to manage and coordinate the Finalization process. The consultant revising the original document was retained as the principal consultant to perform the major task of synthesizing the suggested course modifications from the five Training Centers, their faculties, and LEAA.

Description

The Criminal Justice Analysis Course consists of an Orientation, Introduction, seven instructional units (modules), and two optional instructional units.

The emphasis in the Criminal Justice Analysis Course is on an interactive, participatory learning environment. Several activities help insure the achievement of course and module objectives. During the course there are traditional classroom lectures, six small exercises, one major exercise, one optional workshop, ten "walk-throughs" and one optional "walk-through".

The walk-throughs are exercises or problems in which all of the answers or expected outcomes are revealed to participant and instructor. The instructor will describe the process or "walk-through" these activities with participants. No actual participant work or facilitation is required. The walk-throughs illustrate teaching points and lesson objectives within a module.

Frequently walk-throughs are followed by one of the small exercises or one of the tasks of the major exercise. The exercises are designed to provide opportunities to "do the work" of the course. All exercises will require a product from participants. Instructors and facilitators will be available to help participants in these activities.

To aid faculty and students in understanding the Criminal Justice Analysis Course, as well as to provide a useful decision-making tool in the conduct of analysis, the course structure and content is recorded in module charts or decision maps.* These module charts provide a guide for organizing

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

the conduct of analysis. They classify the concerns, outline the application of data sources and statistical techniques, and they identify the topics and instruction sequence of the Course. The charts provide a graphical integration of the Course's instructional units. Instructors will use them as a reference to the interrelationships between course modules and as an aid for making transitions between modules. They are useful also as summaries of each module and for subsequent reference by participants.

Documentation and detailed materials pertaining to the Criminal Justice Analysis Course are also presented in the Criminal Justice Analysis Text.

Acknowledgements

The Principal Consultant to the Washburn Criminal Justice Training Center who served as the author/coordinator of instructional material is Seth I. Hirshorn, Ph. D., Ann Arbor, Michigan.

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At the Washburn University Criminal Justice Training Center the project was under the general direction of Lyle D. Newton, Director of the Center. Allen R. Beck, Ph. D., Assistant Director for Analysis, served as the manager of the Analysis project. Kathy J. Goldsmith, Elizabeth Ann Lorenzen, Keri D. Luttijohann, and Tina J. Sumpter were in charge of the extensive word processing requirements of the project. Leslie C. Fraser, Administrative Officer and Robert C. Tompkins, Administrative Assistant, performed a multitude of tasks ranging from management to printing. Rita M. Eraas, Michael W. Goldsmith, Robert J. Mason, Pat A. Overbey, Vickie A. Rush, and Ormond L. Wimberly worked on numerous graphics and production tasks.

The glossary was compiled by Carolyn A. Thieme-Busch, Training Division, Office of Operations Support, LEAA.

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

ORIENTATION

The purpose of the orientation is to provide logistic and background information to participants.

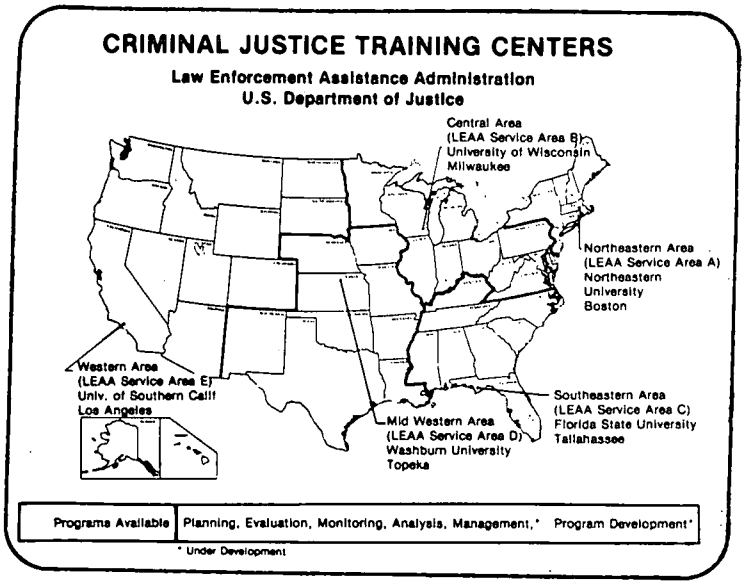
I. PURPOSE OF ORIENTATION

II. THE FACILITY AND AREA

III. ADMINISTRATIVE MATTERS

IV. CRIMINAL JUSTICE TRAINING CENTER

V.A. (O-1):



V. STAFF AND FACULTY

VI. PARTICIPANTS

VII. COURSE MATERIALS

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.

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.

I. COURSE OVERVIEW

A. Course Goals

+ 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.

+ 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.

+ 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.

B. Course Participants

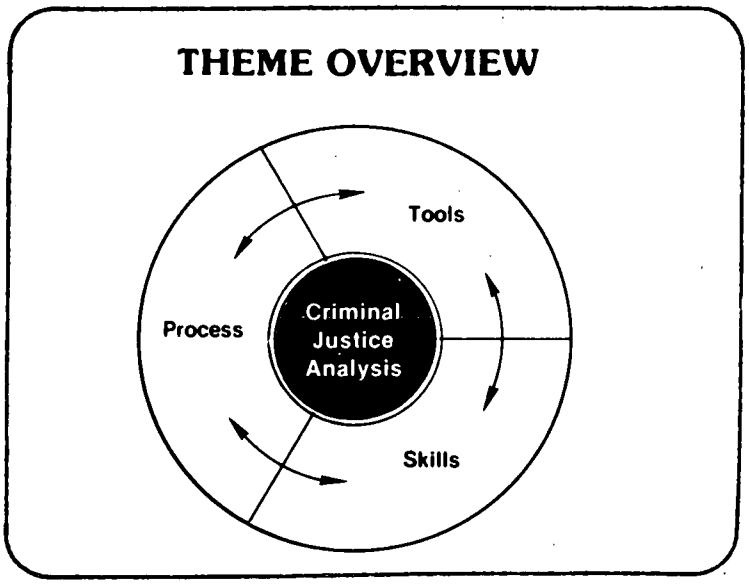
+ The introductory nature and goals of the course indicate that it is for those who seek to understand the analysis process and gain knowledge of how to apply basic analytical tools used in formulating crime and criminal justice system problems.

+ 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.

V.A. (IN-1):



D. Values or Purposes of Analysis

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

  - Unique tasks in LEAA delivery system require analysis.

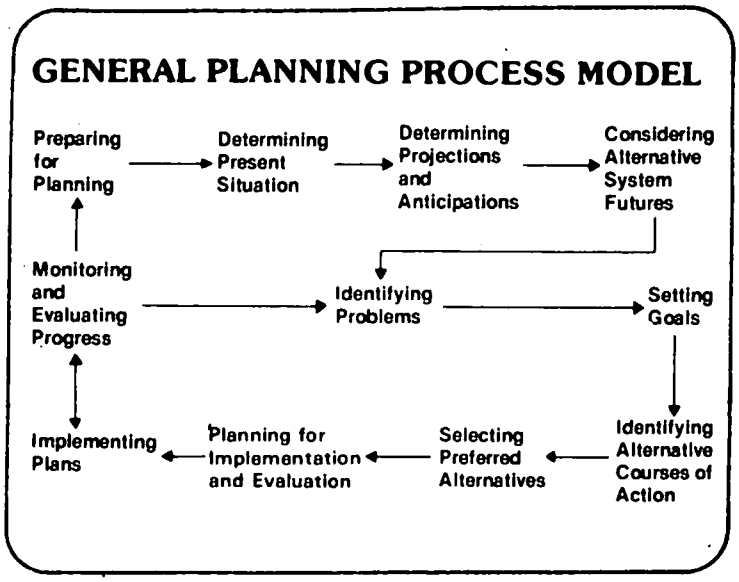
  - Problem analysis requirements of guidelines.

  - Analysis is used as input to decision-makers.

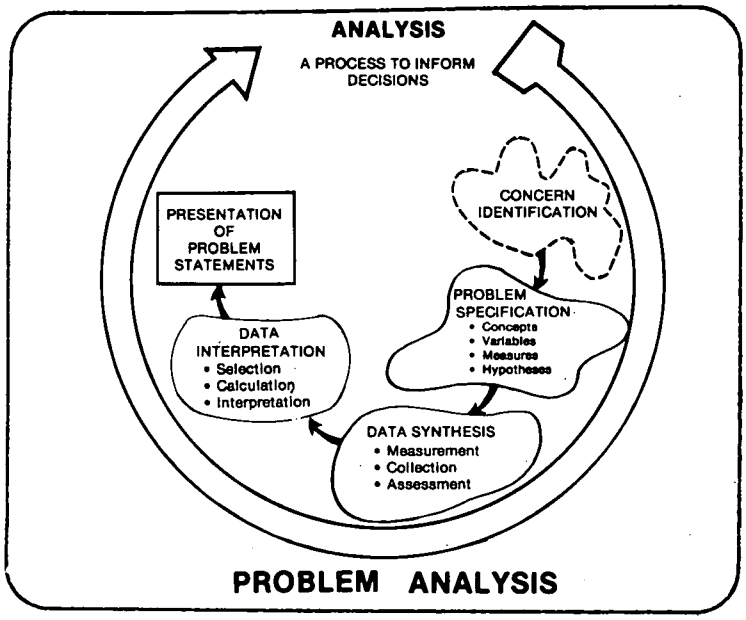
+ Competencies central to the role of the analyst.

+ Analysis is an integral part of Planning Process.

V.A. (IN-2):



V.A. (IN-3):



E. Process as Roadmap

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

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

+ Exhibit 1 is a preview of the entire course.

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

+ Exhibit 2 is the course agenda.

Exhibit 1. Course Overview

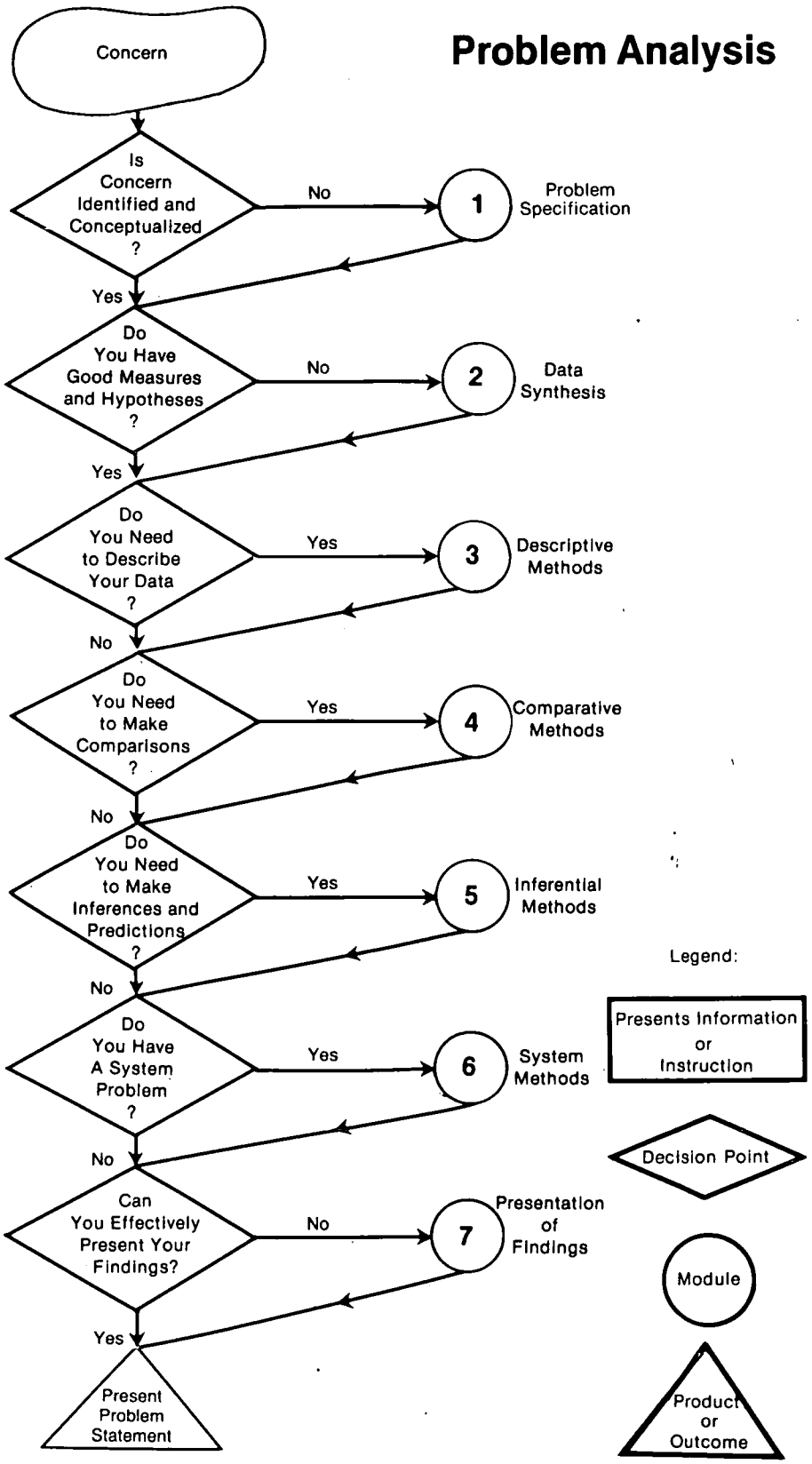


Exhibit 2

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)					

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.

OBJECTIVES

1. To describe the use of specific techniques for managing analysis tasks.

2. To describe the benefits from planning an analysis effort.

I. ANALYSIS PLAN

A. Definition

+ 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

+ Pre-preparation of an analysis plan for any sizeable analysis task is necessary to produce results which are reliable and efficiently produced.

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

+ Sometimes development of an analysis plan is mandatory.

C. Developing an Analysis Plan

+ 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.

D. Work Plan

+ Quality Control

+ Staff Relations

+ Budget Control

+ Client Relations

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

II. WORK PLAN

A. Overview

+ 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.

+ A number of management tools are available to assist in this task.

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

---

B. Tasking

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

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

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

  - Gantt Chart

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

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

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

Exhibit 2.

GANTT CHART

State Analysis of Local Crime Reduction Program Impacts by Month

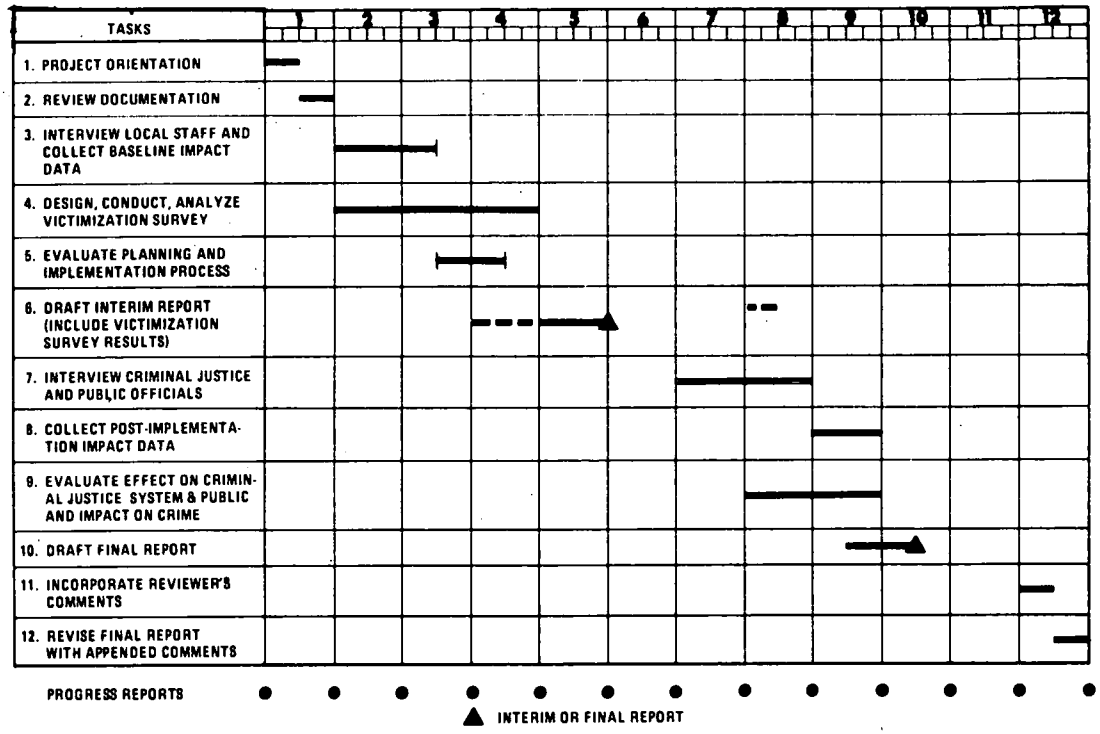
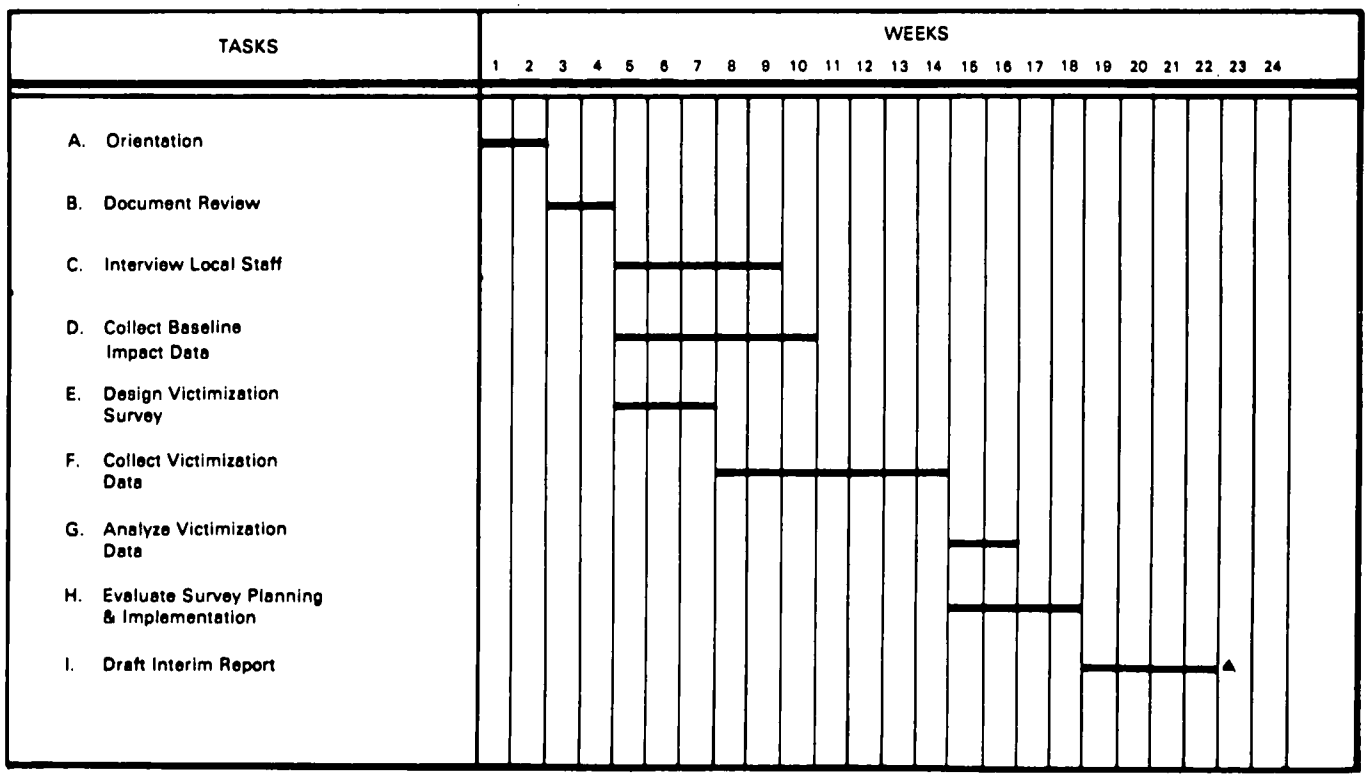


Exhibit 3.

GANTT CHART

State Analysis of Local Crime Reduction Program Impacts - Weekly Schedule



PERT Chart

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

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

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

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

NOTES

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."

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.

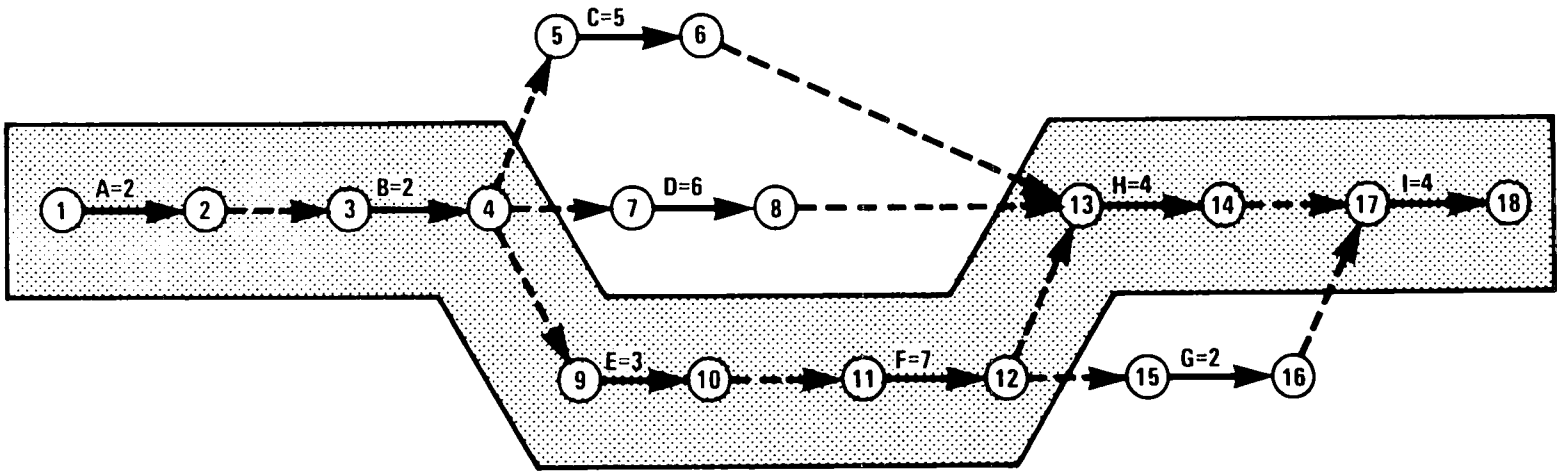
By adding the times along each possible path, the critical (or longest) path may be determined.

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.

Exhibit 5

PERT Network With Critical Path Indicated For Analysis Project

(Task = Time in Weeks)



EVENTS

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

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

PERT technique is useful for:

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

During the implementation phase:

Monitoring progress and slippage during implementation.

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

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

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

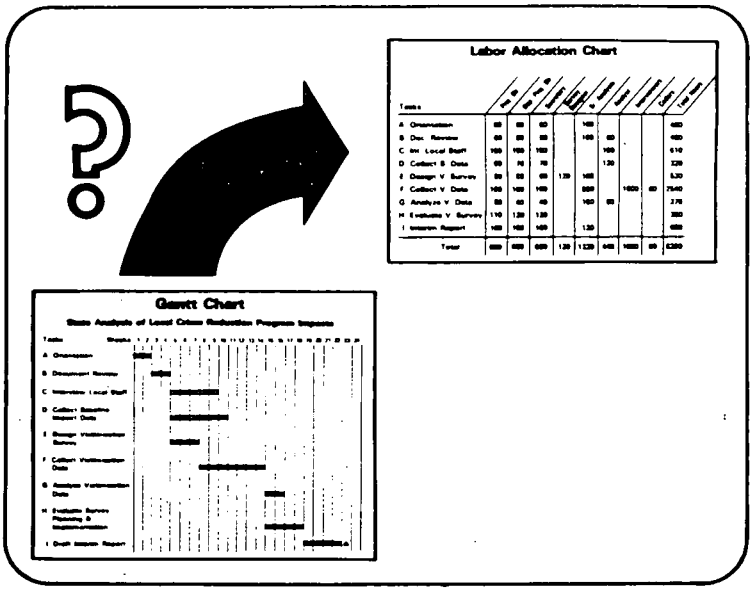
2. PERT

* 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

NOTES

C. Labor Allocation

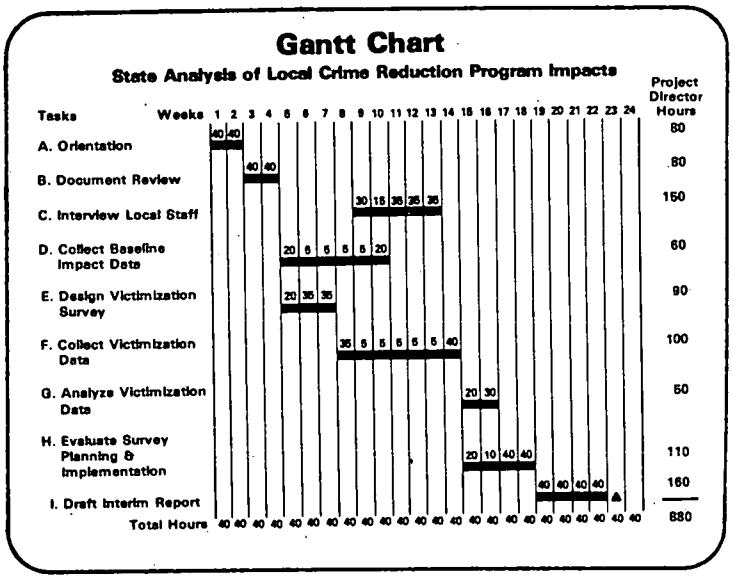
V.A. (Mgt.-2):



- 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.

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

V.A. (Mgt.-3):

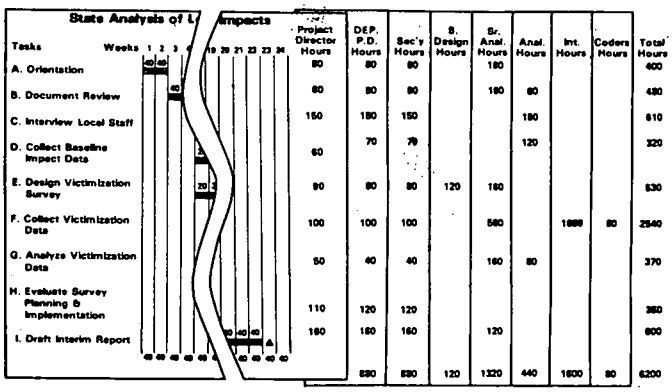

Gantt Chart
State Analysis of Local Crime Reduction Program Impacts
Tasks
Weeks 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Project Director Hours
A. Orientation 40 40 80
B. Document Review 40 40 80
C. Interview Local Staff 30 15 35 35 35 150
D. Collect Baseline Impact Data 20 5 5 5 5 20 60
E. Design Victimization Survey 20 35 35 90
F. Collect Victimization Data 35 5 5 5 5 5 40 100
G. Analyze Victimization Data 20 30 50
H. Evaluate Survey Planning & Implementation 20 10 40 40 110
I. Draft Interim Report 40 40 40 40 160
Total Hours 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 40 880

NOTES

- Consolidating Gantt Charts

V.A. (Mgt.-4):

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



Tasks	Project Director Hours	DEP. P.D. Hours	Sec'y Hours	S. Design Hours	Sr. Anal. Hours	Anal. Hours	Int. Hours	Coders Hours	Total Hours
A. Orientation	80	80	80		160				400
B. Document Review	80	80	80		160	80			480
C. Interview Local Staff	150	150	150			160			610
D. Collect Baseline Impact Data	60	70	70			120			320
E. Design Victimization Survey	90	80	80	120	160				530
F. Collect Victimization Data	100	100	100		560		1600	80	2540
G. Analyze Victimization Data	50	40	40		160	80			370
H. Evaluate Survey Planning & Implementation	110	120	120						350
I. Draft Interim Report	160	160	160		120				600
		880	880	120	1320	440	1600	80	6200

- Labor Allocation Chart

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

Exhibit 7.

Labor Allocation Chart

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

NOTES

D. Budget

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

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

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

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.

+ 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

+ Tasking

Gantt or Pert Chart

+ Labor Allocation

Labor Allocation Chart

+ 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.

V.A. (Mgt.-5):

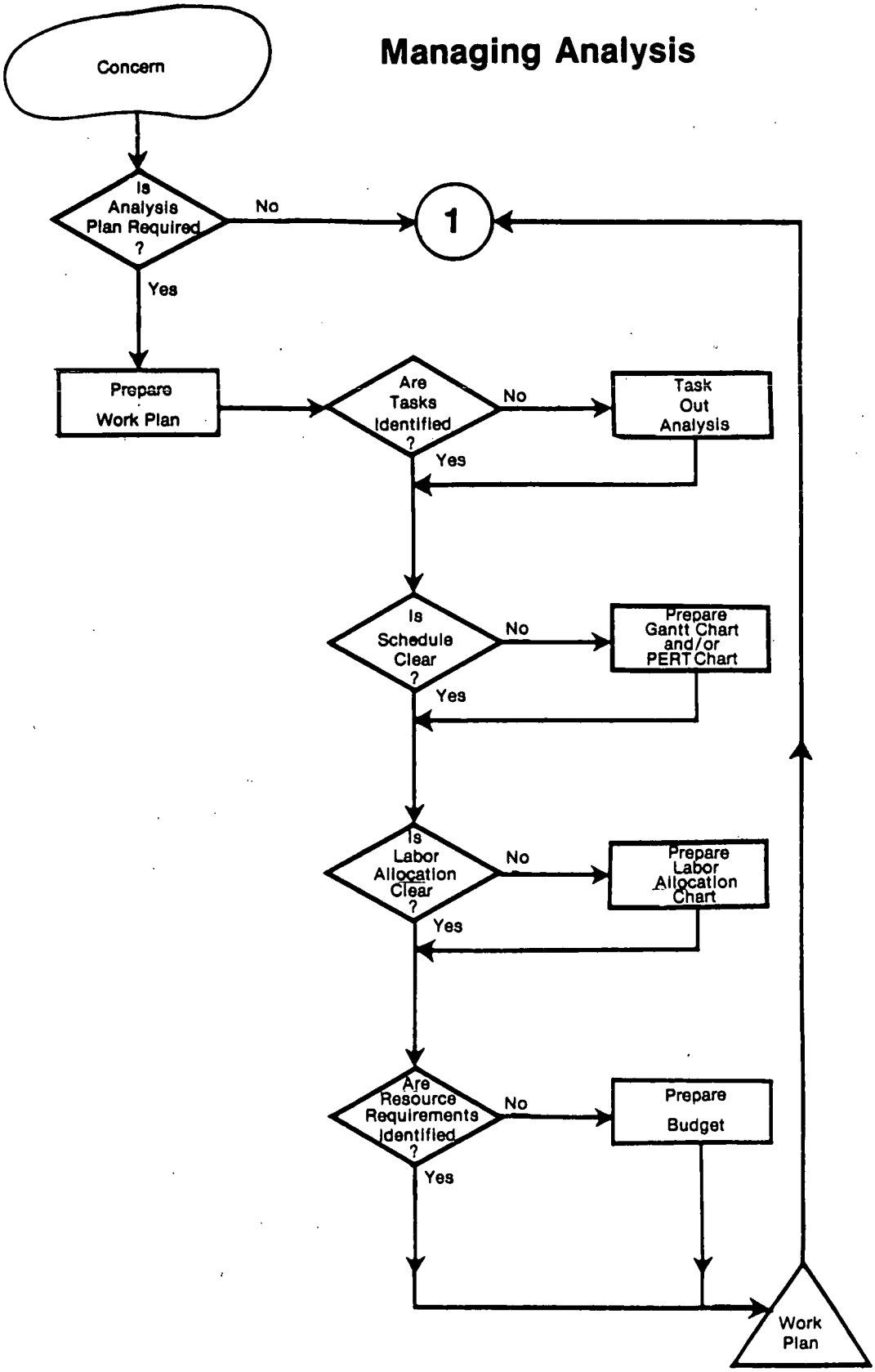
BENEFITS OF PLANNED ANALYSES

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

NOTES

IV. CONCLUSION

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.

I. HOW ARE PROBLEM STATEMENTS DEVELOPED?

A. Two general approaches:

+ 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.

+ 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.

  - 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:

+ Definition: In this course Problem Specification is defined as the identification of concerns; elaboration of concepts, variables, and measures; and postulating of hypotheses.

II. HOW ARE CONCEPTS, VARIABLES and MEASURES ELABORATED?

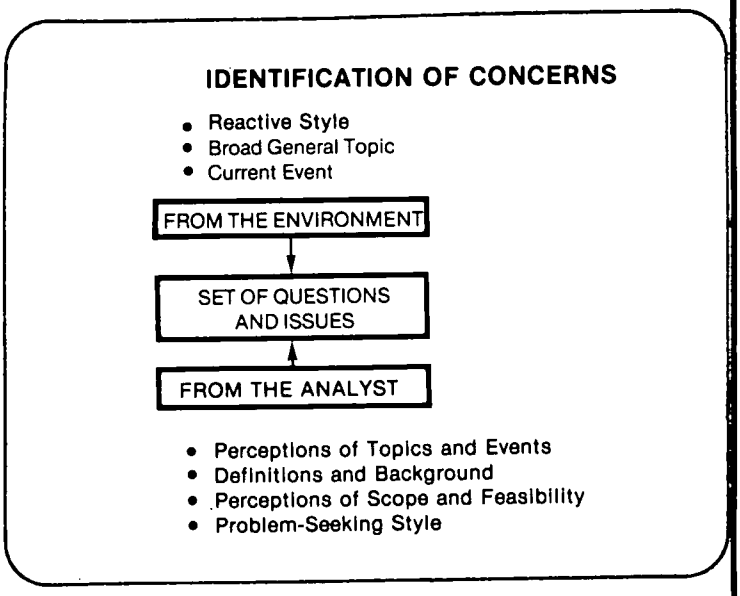
A. Identification of Related Concerns:

+ 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.

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

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

V.A. (1-1):



+ There are interactions and interdependencies among concerns.

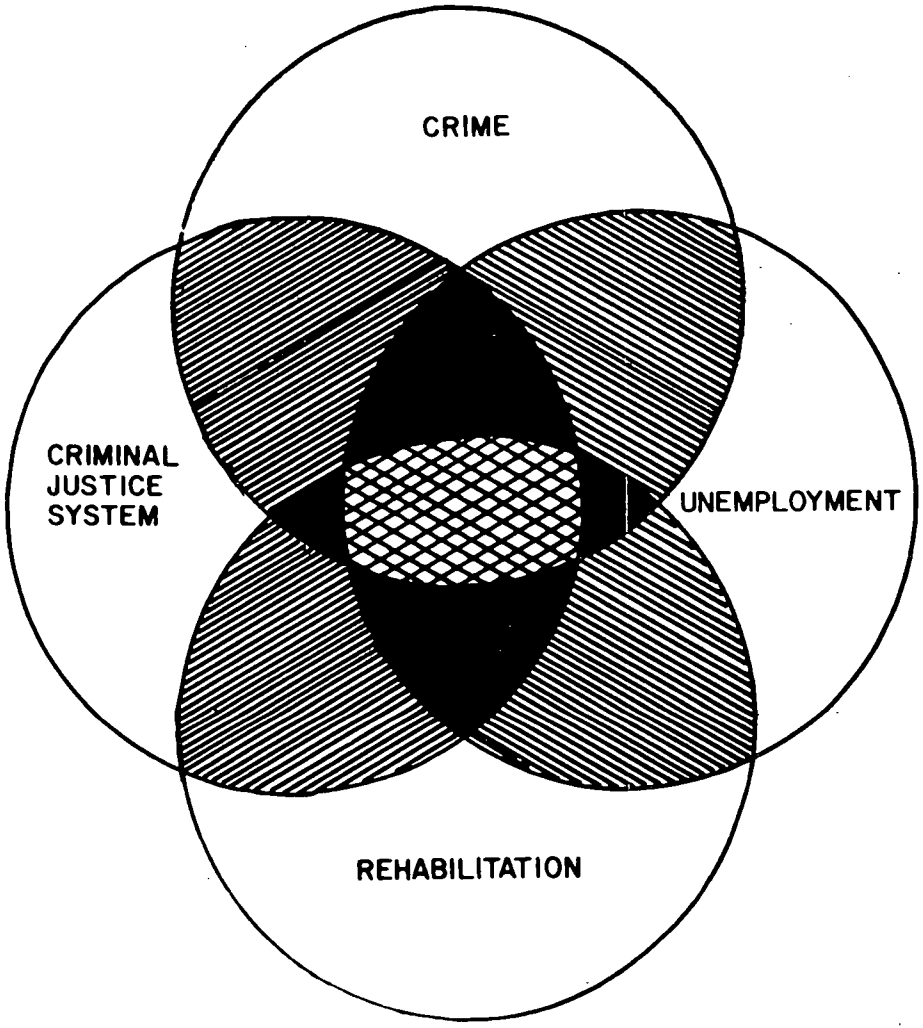
  - Many stated concerns may involve interactions and relations among concerns.

  - 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.

  - 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

+ 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.

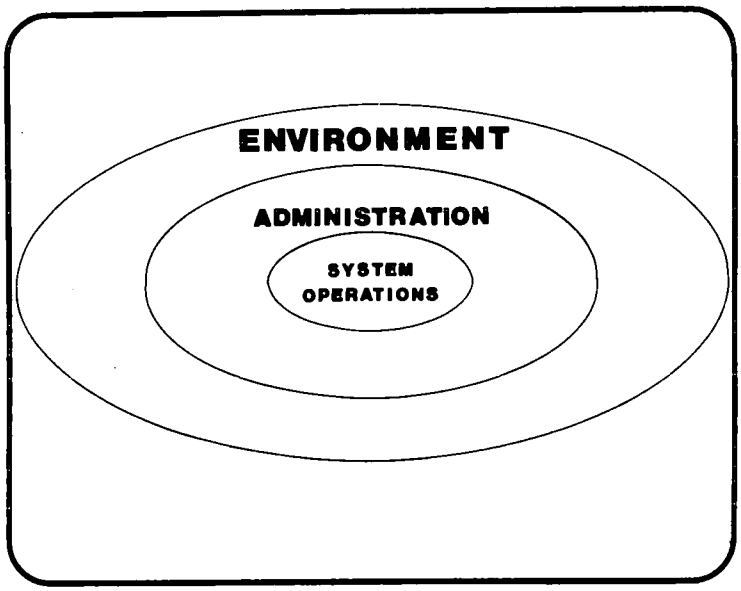
+ Concepts vary in terms of their abstractness; e.g., seriousness of crime is more abstract than the incidence of crime.

+ 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.

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

  - 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.

V.A. (1-2):



- 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.

C. Elaboration of Variables

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

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

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

D. Elaboration of Measures

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

+ 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.

+ 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.

+ 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.

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

Typical Statements of Concerns about
Crime and the Criminal Justice System

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.

WALK-THROUGH 'A'

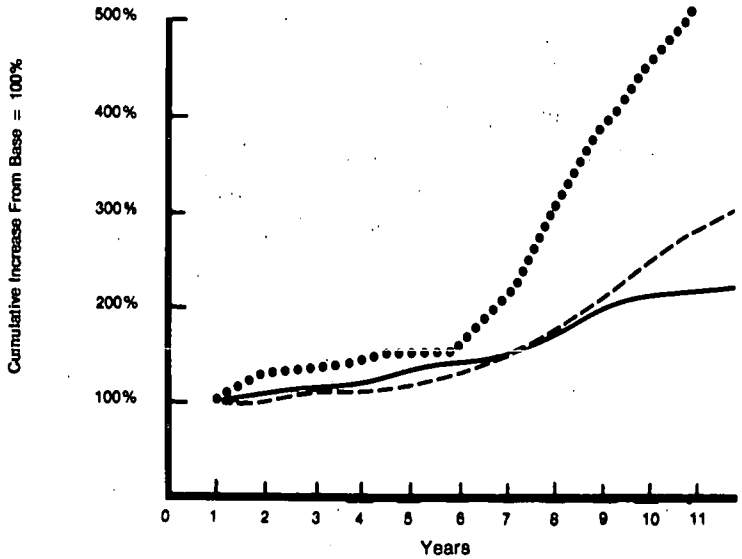
DATA SET/WORKSHEET

A. Example 1 Example of a Concern Statement

Crime Trends in Chaos City

Historically, aggravated assault and homicide rates in this area have been relatively low, and these crimes have not been considered serious problems. 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. Analysis of recent trend data, however, indicates that the city's assault rate has shown dramatic increases over the last several years. These increases substantially out-distance the proportional increase in robberies and indicate that unless preventive action is taken assaults may become a significant problem. This trend is exacerbated by recent signs that the homicide rate is now increasing as a result of the increase in assaults. 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



Aggrevated Assault ●●●●
Homicide -----
Robbery ——

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)

CONCEPTS	VARIABLES	MEASURES
*(Rate)	*(Rate of Change by Crime Type)	*(Rank ordering of perception of rate of change by crime type)
	*(Rate of Change of Seriousness by Crime Type)	*(% difference over years of average S-W Index for each type crime)
*(System Operation) - Preventive Action	*(Patrol Deployment)	*(% of available manpower allocated per area by time period)

*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

B. Example 2

District Court Processing of Felony Cases

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.

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

CONCEPTS	VARIABLES	MEASURES
Court Operation	Case Disposition	% of cases falling in each disposition category *(% of cases falling in each category compared to national average.)
	*(Input)	*(# of Judges) *(# of case filings per Judge) *(# of case filings by case type per Judge)
	*(Performance)	*(# of cases heard per Judge) *(# of cases heard by case type per Judge)

*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

C. Example 3

Rape in Chaos City

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.

WALK-THROUGH 'A'

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

CONCERN: Rape in Chaos City

CONCEPTS	VARIABLES	MEASURES
Magnitude	Reporting of Rape	# of rapes reported # of rapes not reported (via victimization studies)
		*(% of rapes in population at risk.)
System Operation	Conviction Rate	*(% of case filings resulting in conviction)

*Statements in parentheses are implied elaborations.

WALK-THROUGH 'A'

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.

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 and may suggest potential problem-solving strategies.

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

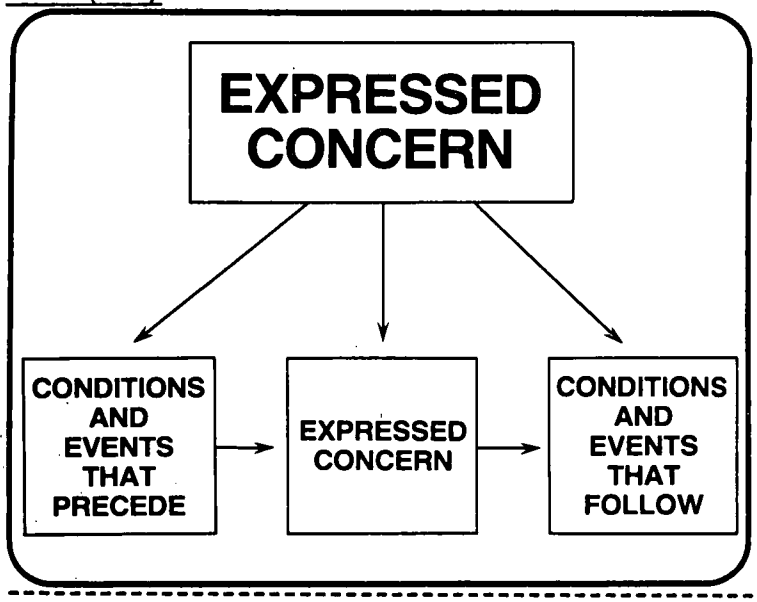
   Descriptive hypotheses are most typical of the kind usually dealt with a criminal justice. They usually involve considerations of logical or temporal sequence, but do not involve issues of "cause" and "effect".

When 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 which is under study.

V.A. (1-3):



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

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

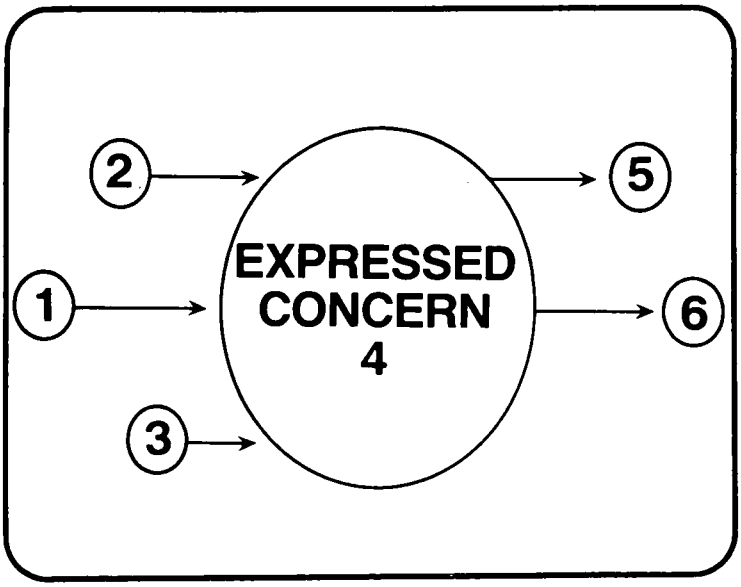
In a causal hypotheses, a cause and effect relationship is asserted between dependent and independent factors:

- 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 catagories: "presumed causes", "primary effects" and "secondary effects".

V.A. (1-4):



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.

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.

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.

DATA SET

PROBLEM STATEMENT: VEHICLE THEFT IN CHAOS CITY, 1977

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WALK-THROUGH 'B'

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.

WALK-THROUGH 'B'

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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.

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

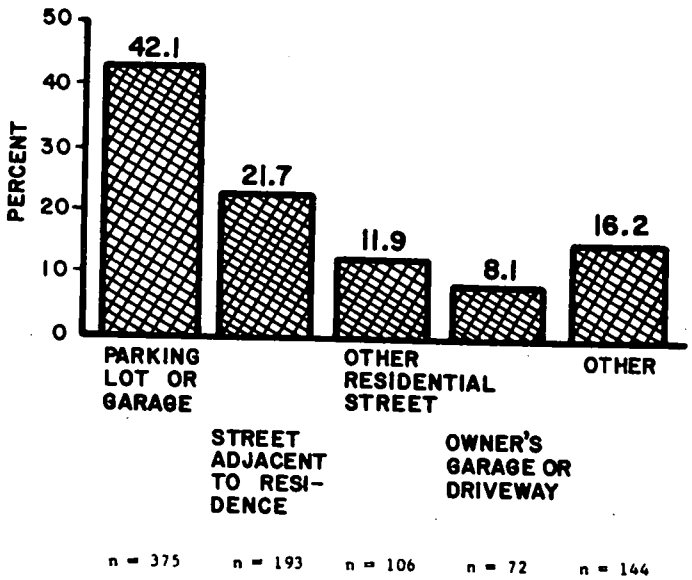
*Each registered passenger vehicle is counted as an opportunity. Each community has a sufficiently large number of vehicles to make meaningful comparisons: Calhoun-Isles, 14,995; Camden, 13,338; Central, 6,525; Longfellow, 13,080; Near North, 14,334; Nokomis, 19,907; Northeast, 16,853; Powderhorn, 28,411;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

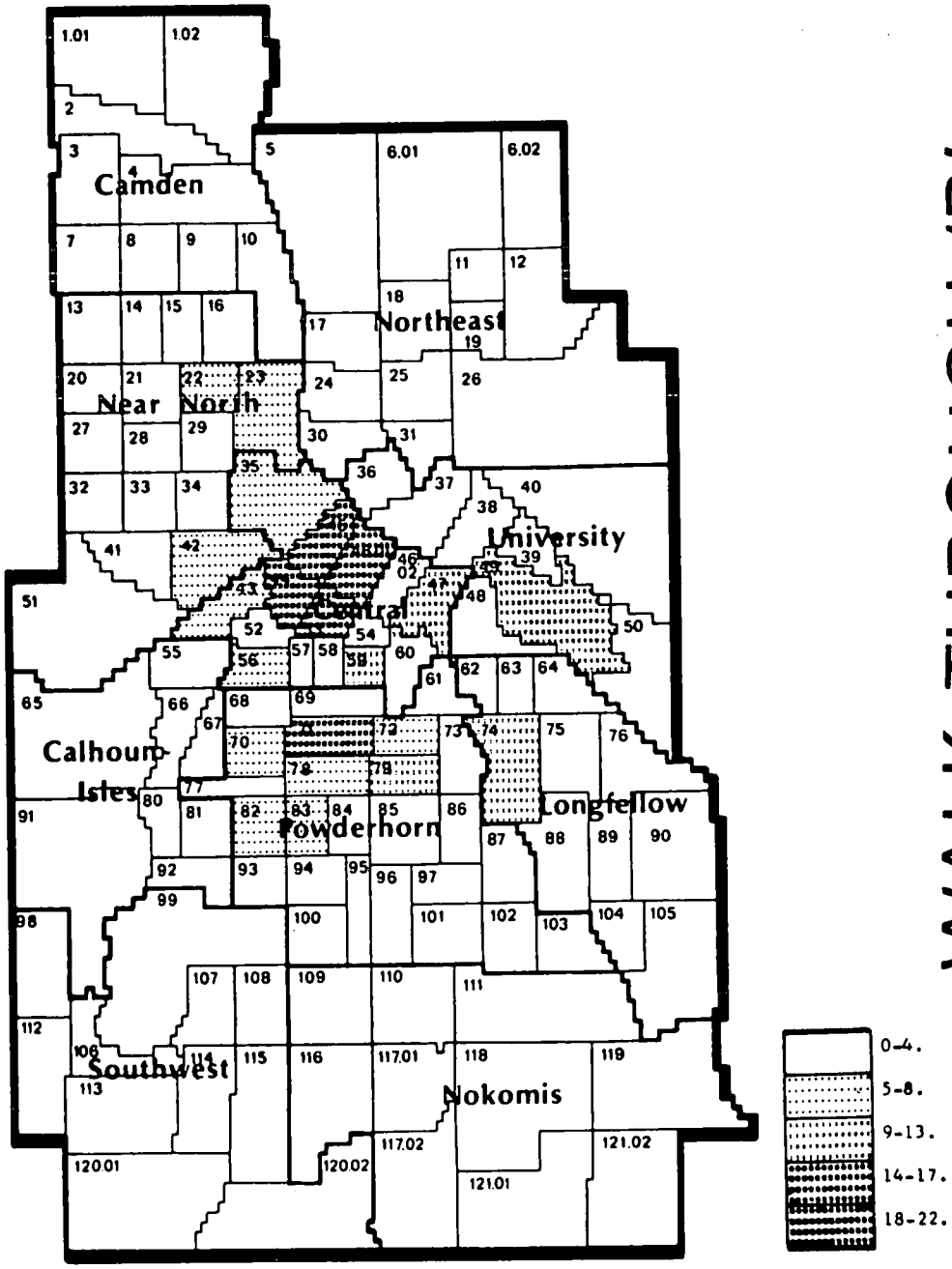


Source: Chaos City Police Offense Report Data, (N = 890), 1977.

WALK-THROUGH 'B'

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
Offense Report Data 1977

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.

WALK-THROUGH 'B'

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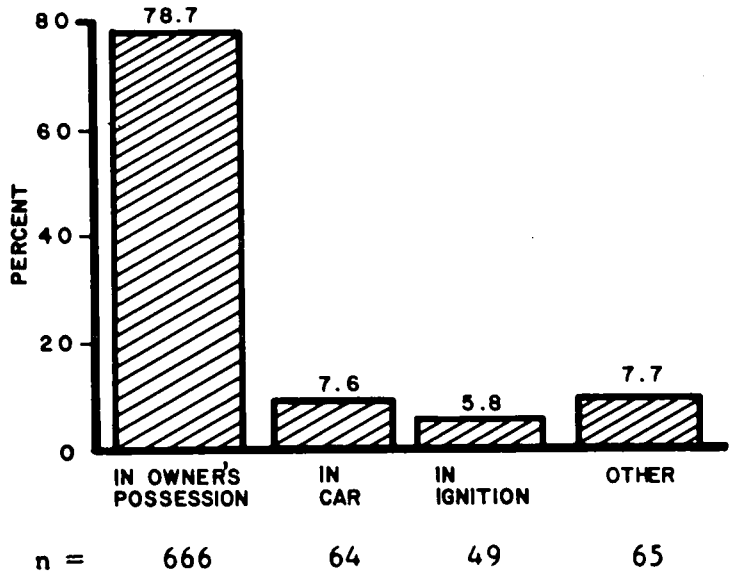
[5]"Preliminary Study of the Effectiveness of Auto Anti-Theft Devices," NILECJ, (Washington, D.C.: October 1975), p, 1.

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'

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'

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

CONCEPTS	VARIABLES	MEASURES
3.1 Magnitude	Frequency	# vehicles stolen Aver. # of vehicles stolen for similar sized cities.
	Victimization Rate	# vehicles stolen as reported in victimization survey. # vehicles stolen divided by number registered autos.
3.2 System Response	Clearance Rate	% of cases with arrested suspect. % of cases cleared nationally. % of cases cleared in State of Paradise.
	Conviction Rate	None provided in Problem Statement.
	Sentencing Pattern	None provided.

WALK-THROUGH 'B'

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

CONCEPTS	VARIABLES	MEASURES
3.3 Seriousness	Net Dollar Loss	Dollar value of vehicles not recovered. Dollar value of burglary property not recovered.
	Recovery Rate	% of autos recovered.
	Costs of Victim Due to Theft	Cost of loss of transportation. Amount of increased insurance premiums.
	Cost to Criminal Justice System	Cost of prosecuting offender.
	Other Intangible Costs	None provided.

WALK-THROUGH 'B'

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

CONCEPTS	VARIABLES	MEASURES
3.4 Spatial or Geographical	Geographic Area of City	# autos stolen by planning community.
	Type of Parking Environment	Classification of parking areas into park garages, lots, street, home garages. # autos stolen by parking area classification.
3.5 Opportunity for Auto Theft	Locked Autos	% of stolen vehicles with doors unlocked. % of stolen vehicles with keys left in ignition.
	Improved Security of Automobile	# cars manufactured before and after application of Standard 114.

WALK-THROUGH 'B'

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

CONCEPTS	VARIABLES	MEASURES
3.6 Target Characteristics	Type of Motor Vehicle Stolen	% of automobiles stolen.
		% of trucks stolen.
		% of motorcycles stolen.
	Location from which Types of Motor Vehicles are stolen.	% of type of vehicle stolen from parking lots and garages.

WALK-THROUGH 'B'

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

CONCEPTS	VARIABLES	MEASURES
3.7 Suspect Characterization	Recovery of Stolen Vehicles	% of stolen cars recovered. % of stolen motorcycles recovered.
	Arrest	% of auto thefts, cleared by arrest.
3.8 Offender Characterization	Arrests	# of prior arrests per offender.
	Geographical Area	None provided.

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

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

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES

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

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES

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

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES

WORKSHEET
WALK-THROUGH B, PART B
CONSTRUCTING HYPOTHESES

(Continued)

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES

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

RELATING CONCEPTS	RELATING VARIABLES	RELATING MEASURES

IV. RELATIONSHIP OF PROBLEM SPECIFICATION TO THE PROBLEM STATEMENT

A. The difference between a concern and a problem.

B. Importance of a Problem Statement:

+ 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.

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.

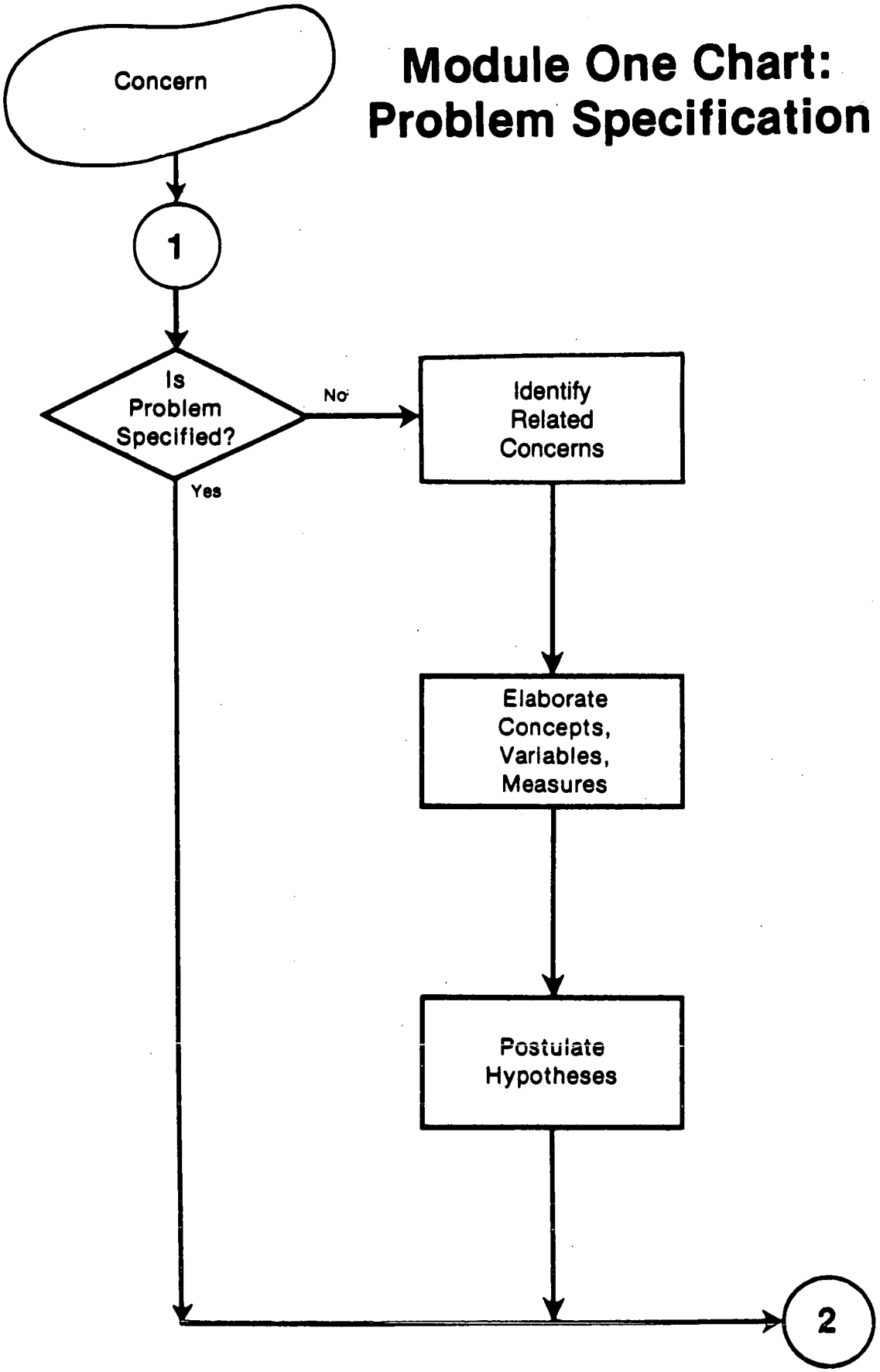
D. Definition of a Problem Statement: A written document or oral presentation which comprehensively describes the nature, magnitude, seriousness, rate of change, persons affected, spatial and temporal aspects of a problem using qualitative and quantitative information. It identifies the nature, extent,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

V. CONCLUSION

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

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.

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.

NOTES

I. MEASUREMENT

A. Definition:

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

+ 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.

B. Measurement Accuracy

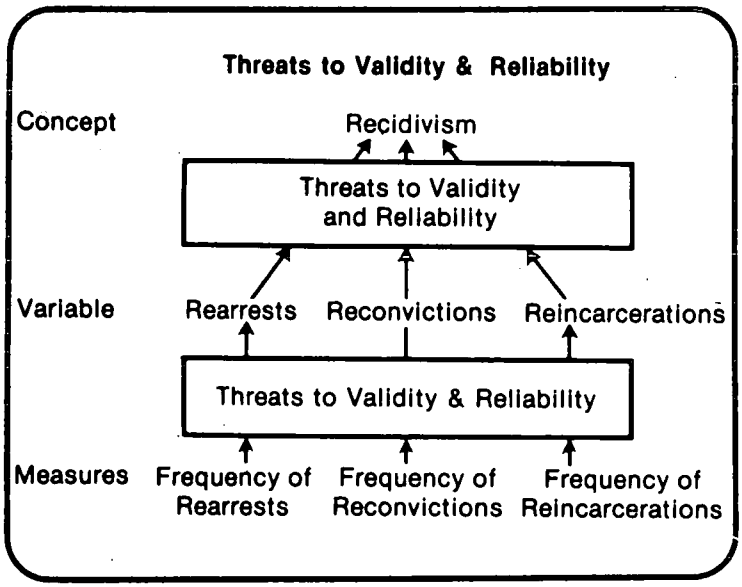
+ The criteria used to determine the accuracy of a measure are its validity and reliability.

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

+ 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."

C. Factors Influencing Measurement Accuracy

V.A. (2-1):



+ Conceptual Factors that Influence the Validity and Reliability of Interpretations

  - Between Concepts and Variables

    Failure to Adequately Represent Concept with Selected Variable(s)

  - Between Variables and Measures

    Failure to Adequately Represent Variables with Selected Measure(s)

NOTES

+ Technical Factors that Influence Validity and Reliability

  - Method of Collection

    Measurement Error in Self-Reported Crime Data

    Measurement Error in Arrest Records

  - Type of Measure Sought (Fact or Perception)

  - Source of Data

  - Use of Sample or Census

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

  Time

  Money

  Organizational Considerations

  Political Considerations

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

V.A. (2-2):

CRITERIA FOR ASSESSING A HYPOTHESIS

- Measurement Accuracy
- Data Availability
- Testability
- Utility

+ Measurement Accuracy
  - Possibly the most important criterion of a good hypothesis is whether the analyst can measure the variables stated in the hypothesis.
  - Even if variables can be measured, the hypothesis may be of questionable merit if the measures are unreliable or invalid.

+ Data Availability

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

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

+ Testability

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

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

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

+ Utility

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

  - Are the hypotheses plausible and easily communicated?

B. Criteria for Assessing a Set of Hypothesis

+ 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.

+ 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.

C. Example of Assessing Hypotheses

III. DATA SOURCES

A. Alternative Data Sources

+ 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.

+ 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

+ Secondary Data Sources

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

- "Actual" Crime Data

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

- Public Opinion Data

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

- Reported Crime Data

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

- Demographic Data

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

- System Data

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

- Juvenile Data

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

+ 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

+ Six Methods of Data Collection

- Field Research

  Direct observation of an agency, process, or procedure.

- Experiments

  Taking action by changing a process, activity or organization and observing the consequences of the change.

- Survey Research

  Collecting responses to questions asked during a sample or census of individuals or groups.

  Three frequently used types of surveys:

  Personal Interview.

  Telephone Interview.

  Mailed Questionnaire.

  Exhibit 1 summarizes comparative advantages/disadvantages for these three types of surveys.

- Content Analysis

  Systematic Study of Books, Articles and Documents.

- Historical Research

  Reconstruction of prior events to explain specific consequences.

- 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.

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

DATA COLLECTION PLAN
(OPTIONAL)

WALK-THROUGH 'C'

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.

DATA SET

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

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

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

Table 2. Management Checklist for Data Collection

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

Table 3. Worksheet

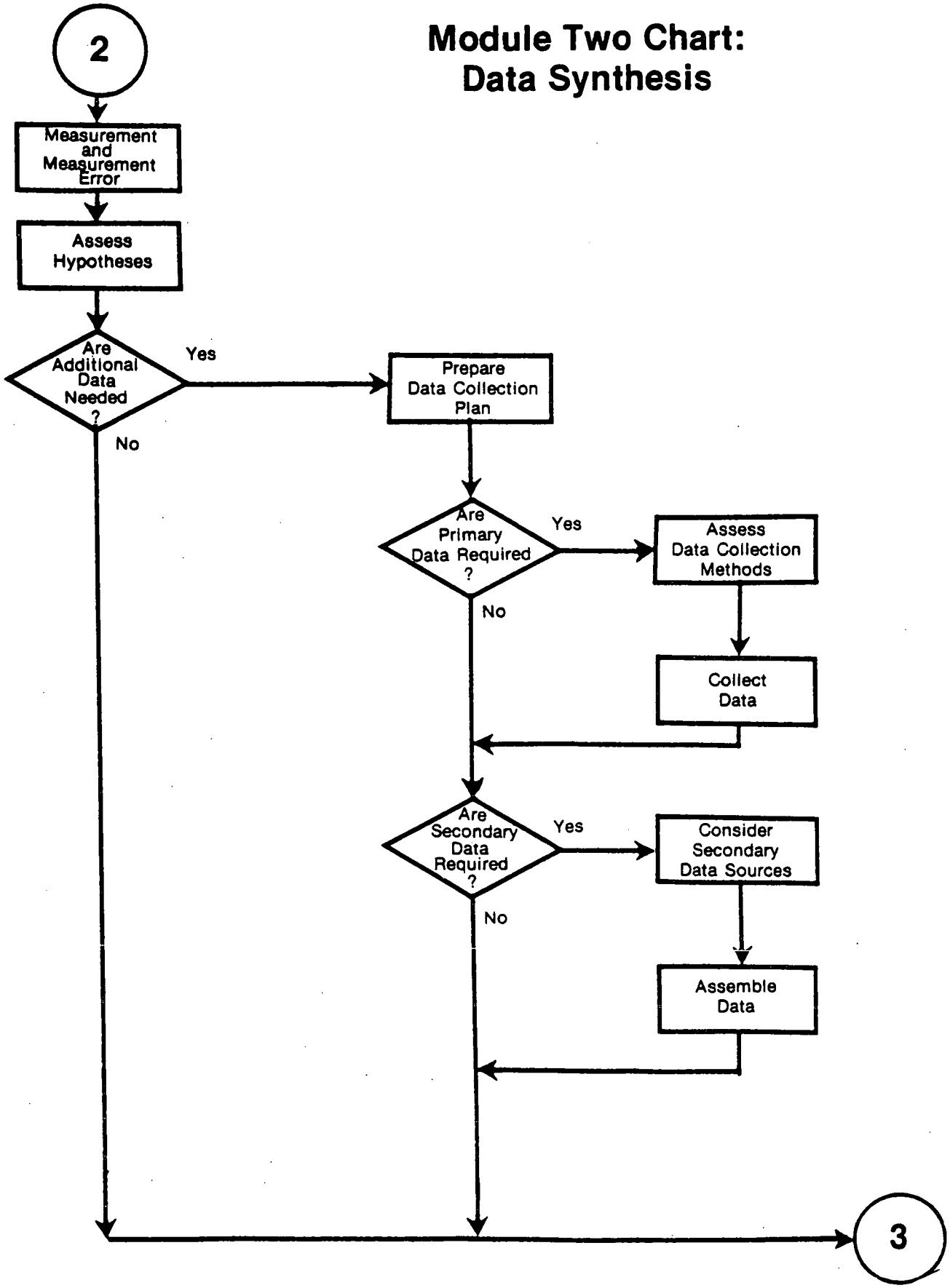
Questions to be answered	Measures	Data Sources	Collection Method	Measurement Accuracy	Other Collection Requirements	Resource Requirements
1. What is the magnitude of the crime problem?	• rates of crime by type	• Data Set	N.A.			N.A.
2. What is the direction and magnitude of the rate of change in the 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'

V. CONCLUSION

V.A. (2-4):

Module Two Chart: Data Synthesis



MODULE 3
DESCRIPTIVE METHODS

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

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

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

I. MEASUREMENT LEVELS

A. Determining Levels of Measurement

+ 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.

+ 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.

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

+ 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.

+ 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.

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

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

+ 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

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

+ 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

A. Measures of Central Tendency

+ Mean

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

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

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	$\Sigma X = 31$

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

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

- 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 mean is useful as a standard for comparison.

+ Median

  - 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.

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

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

- 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.

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

+ Mode

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

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

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

  - The mode is the best measure of central tendency for nominal data.

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.

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 'D'

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

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

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

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

Median = 6

Mode = 8

WALK-THROUGH 'D'

WORKSHEET Continued

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

F. Rank-order the data set.

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

G. Calculate the mean, median and mode.

Mean

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

Median = 5.5

Mode = 4, 8

WALK-THROUGH 'D'

B. Measures of variation

+ Frequency tables

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

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

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

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

Source: Hypothetical Data

+ Range

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

+ Standard Deviation

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

  - Formula for Standard Deviation.

V.A. (3-9):

STANDARD DEVIATION

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

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

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

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.

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	$\overline{X}$	$X-\overline{X}$	$(X-\overline{X})^2$
4	6.2	-2.2	4.84
5	6.2	-1.2	1.44
6	6.2	- .2	.04
8	6.2	1.8	3.24
8	6.2	1.8	3.24
31			12.80

F. Find the range: Range = 4

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

H. Find the standard deviation:

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

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

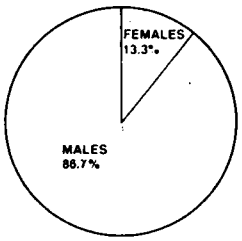
A. Pie Charts

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

B. Bar Graphs

V.A. (3-12):

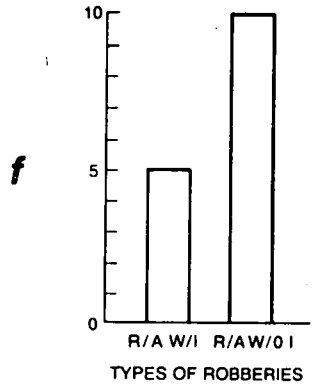
BAR GRAPHS

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

C. Histograms

V.A. (3-13):

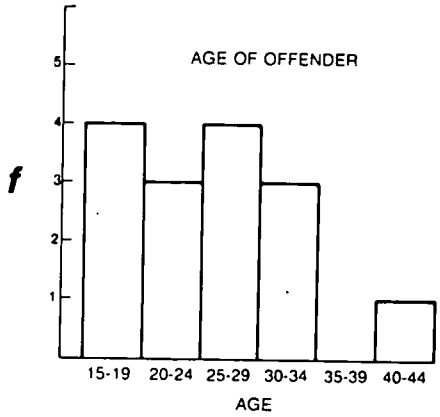
HISTOGRAM

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

D. Frequency Polygons

V.A. (3-14):

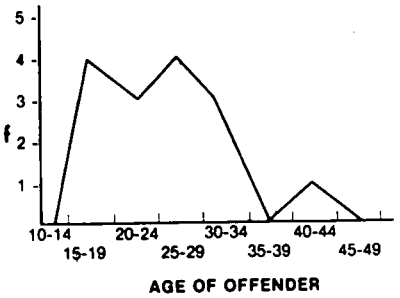
FREQUENCY POLYGON

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

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,

For Race of Offender, Construct:

* A Frequency Table
* A Pie Chart

For Type of Weapon, Construct:

* A Frequency Table
* A Bar Graph

For Age of Victim, Construct:

* A Completed Grouped Data Table
* A Histogram
* A Frequency Polygon

EXERCISE #1

EXERCISE #1 (Continued)

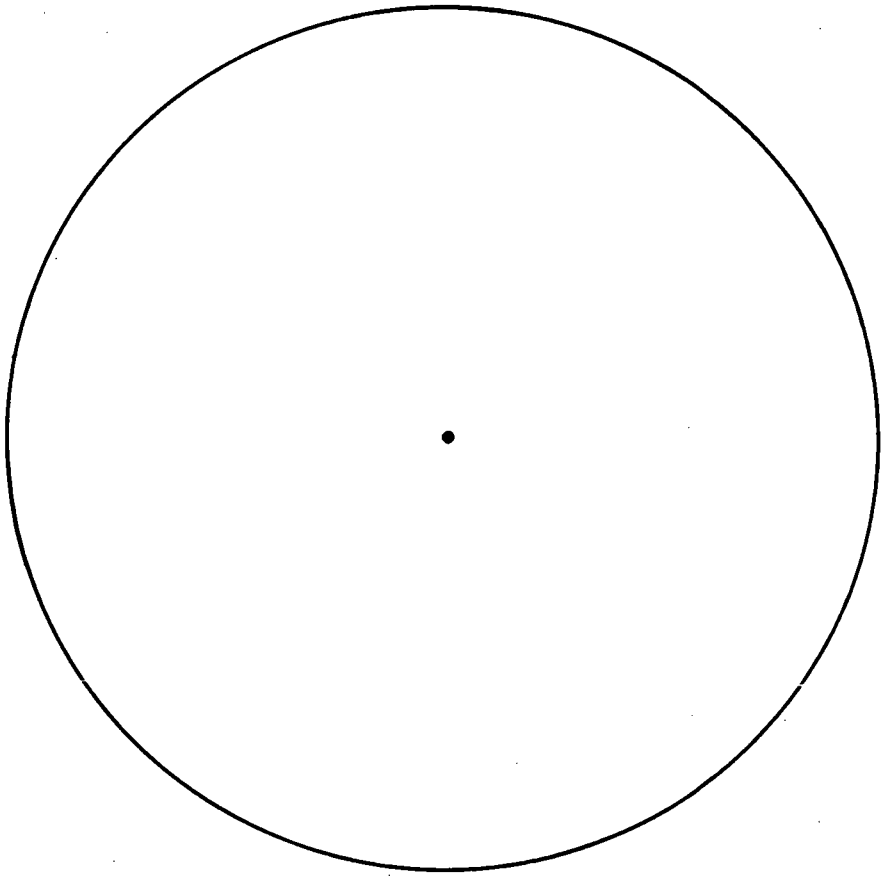
A. Race of Offender

+ Construct a Frequency Table.

Race of Offender	Frequency	Percent	Degrees
White	8		
Black	6		
Indian	1		

Source: Hypothetical Data

+ Construct a Pie Chart.



EXERCISE #1

EXERCISE #1 (Continued)

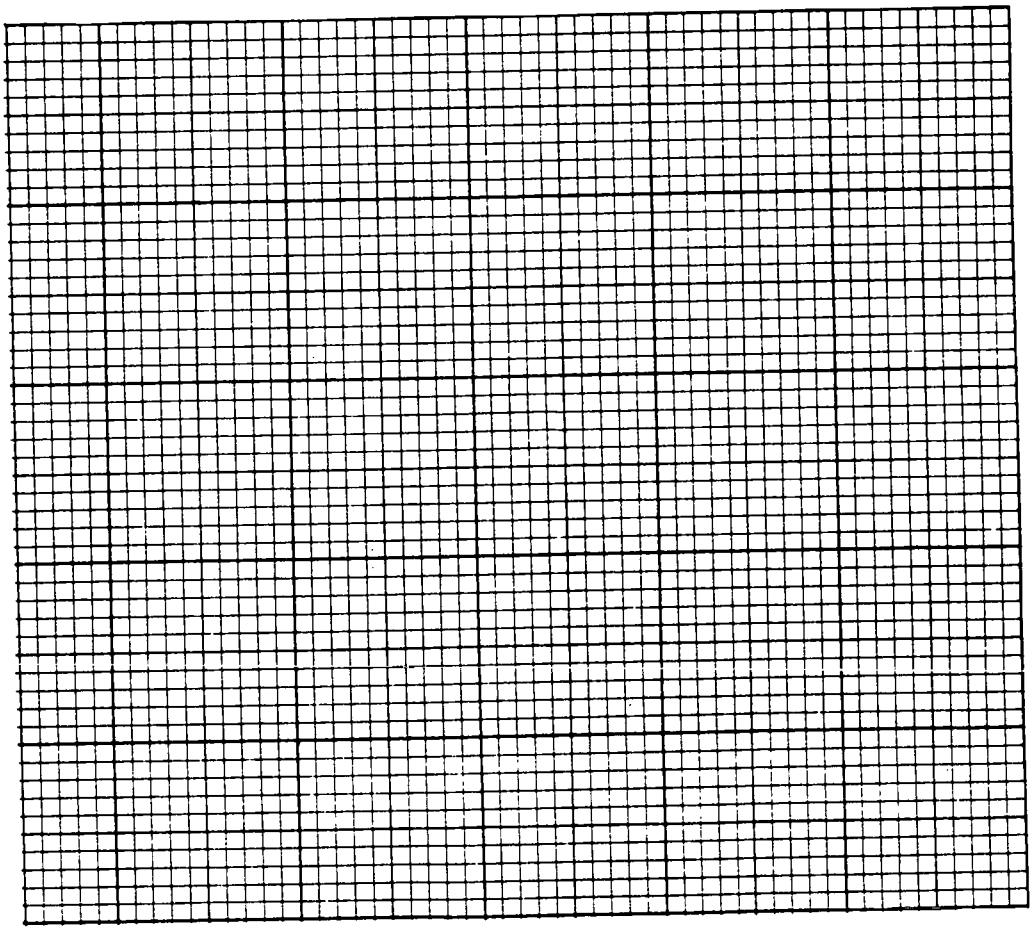
B. Type of Weapon

+ Calculate required values and complete the following table.

Weapon Type	Frequency	Percent
Knife	5	
Gun	7	
None	3	

Source: Hypothetical Data

+ Construct a Bar Graph.



EXERCISE #1

EXERCISE #1 (Continued)

C. Age of Victim

1. Examine the following grouped data table.

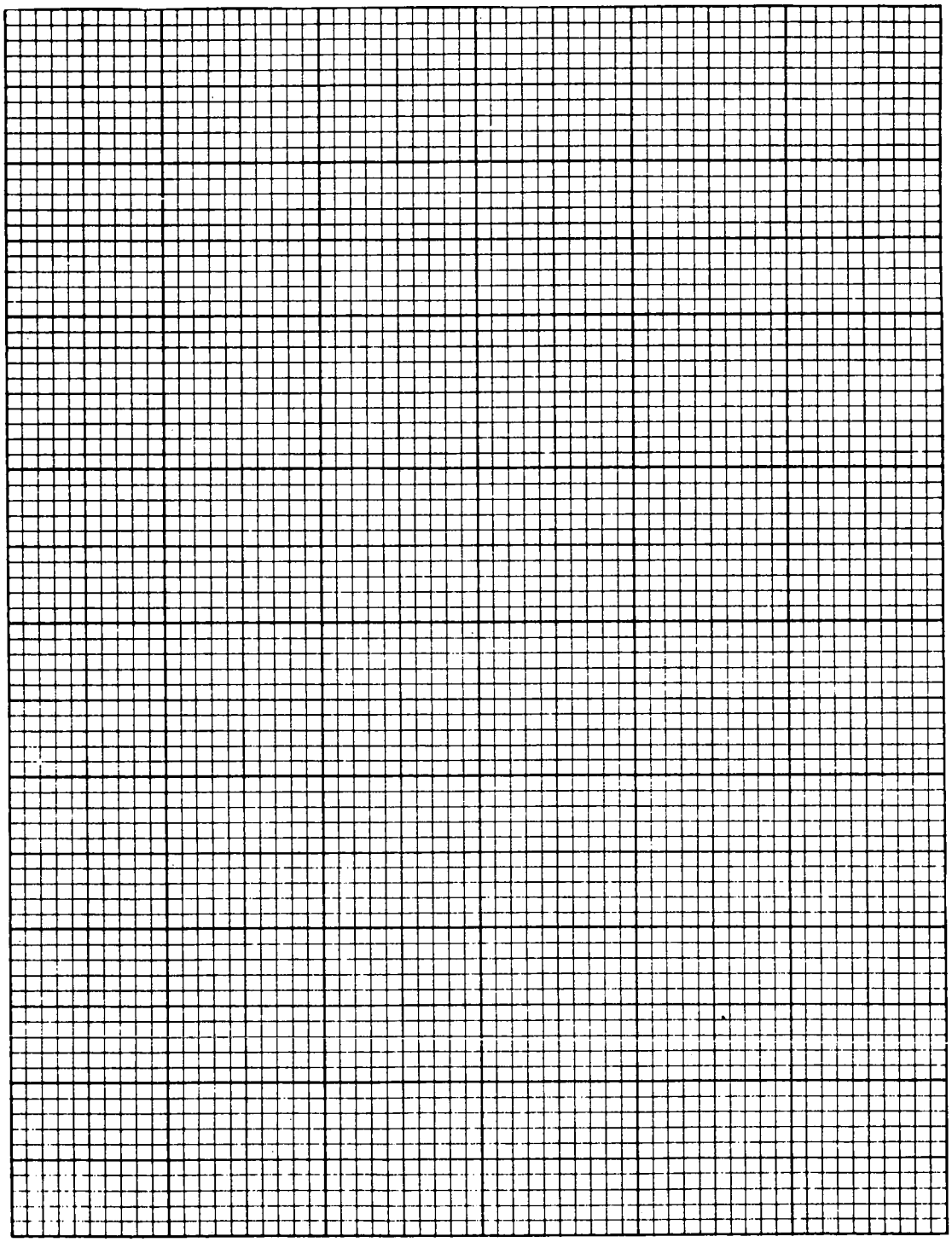
Age of Victim (Apparent Interval Limits)	Frequency
10 - 19	0
20 - 29	2
30 - 39	3
40 - 49	3
50 - 59	0
60 - 69	4
70 - 79	2
80 - 89	1
90 - 99	0

Source: Hypothetical Data

EXERCISE #1

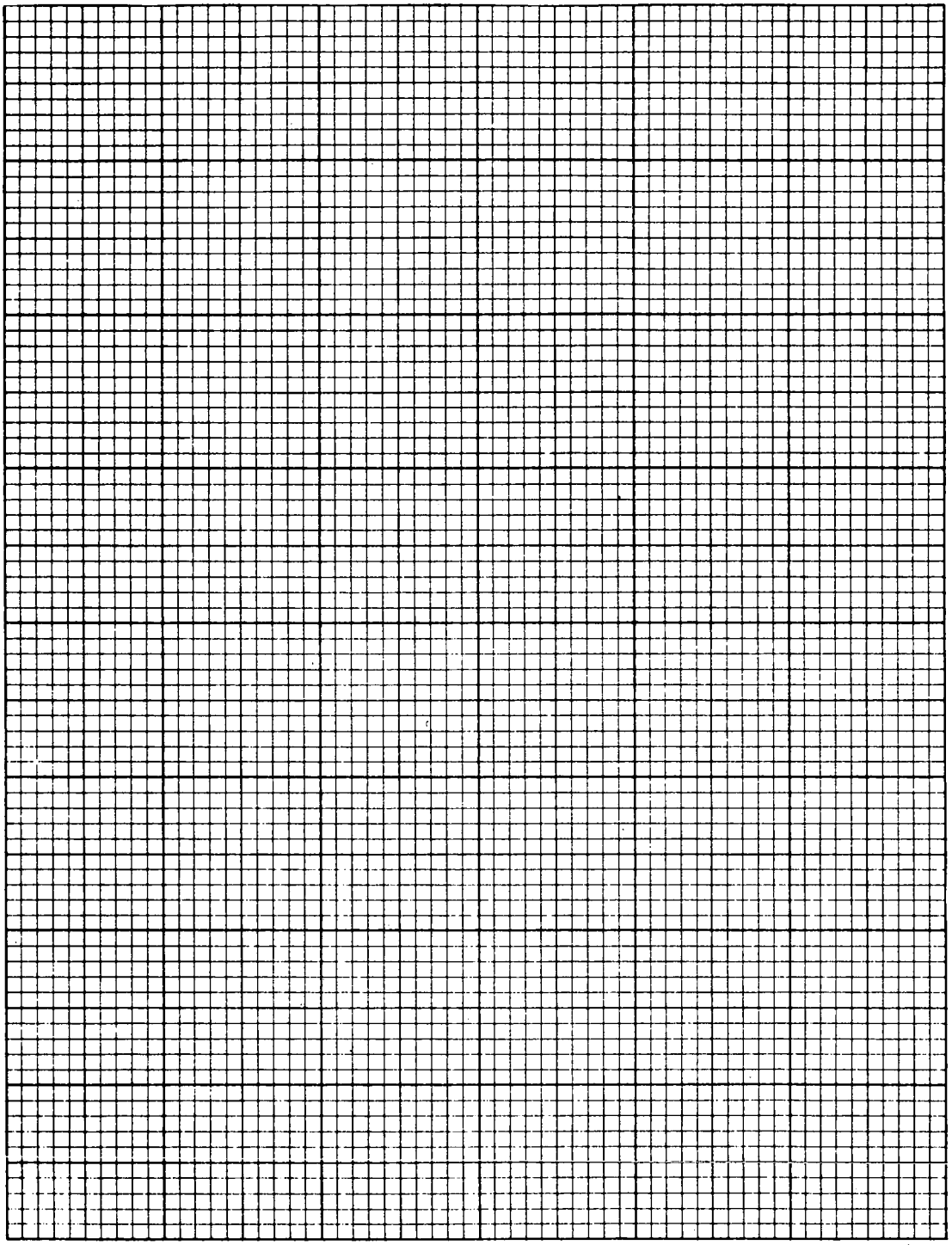
EXERCISE #1 (Continued)

+ Prepare a histogram using the grouped data.



EXERCISE #1

+ Prepare a frequency polygon using the grouped data.



EXERCISE #1

NOTES

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

V.A. (3-15):

PERCENT CHANGE

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

EXAMPLE:

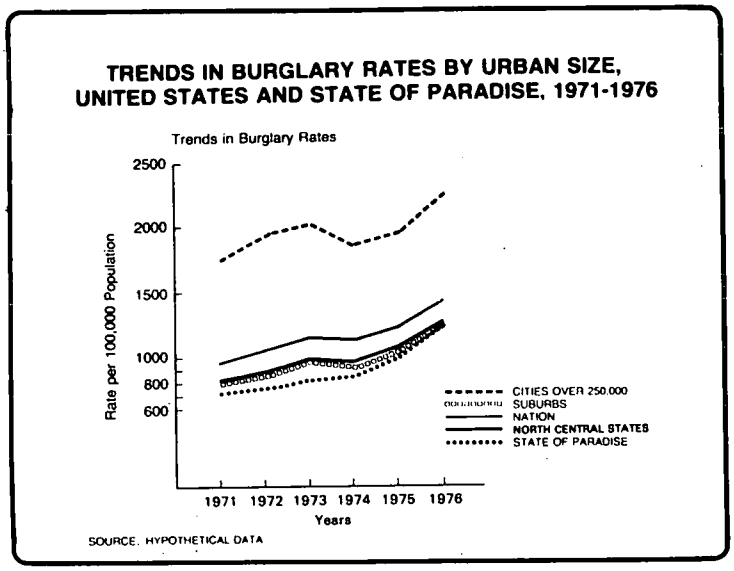
REPORTED ASSAULTS* – 1970: 1128
1974: 1463

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

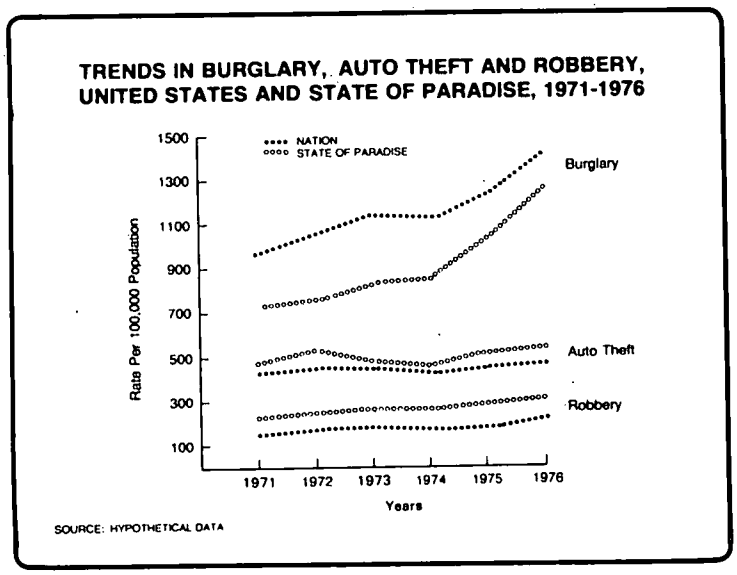
Source: Hypothetical Data
*per 100,000

B. Time Charts

V.A. (3-16):



V.A. (3-17):

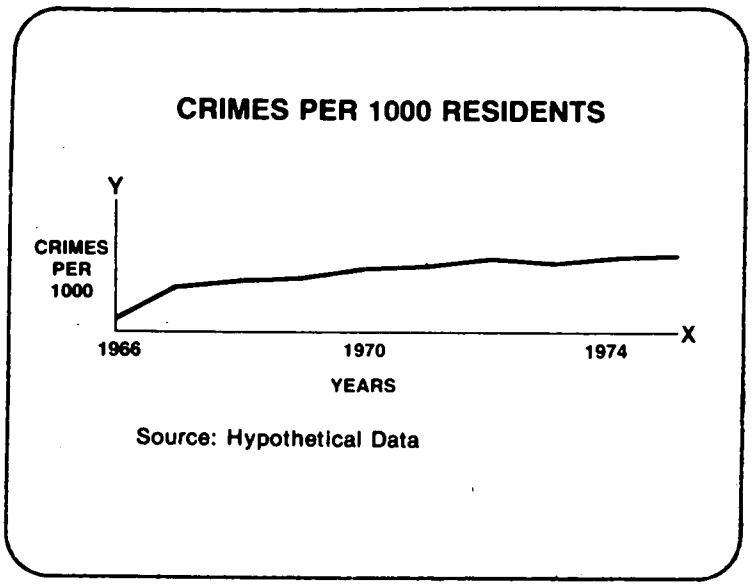


NOTES

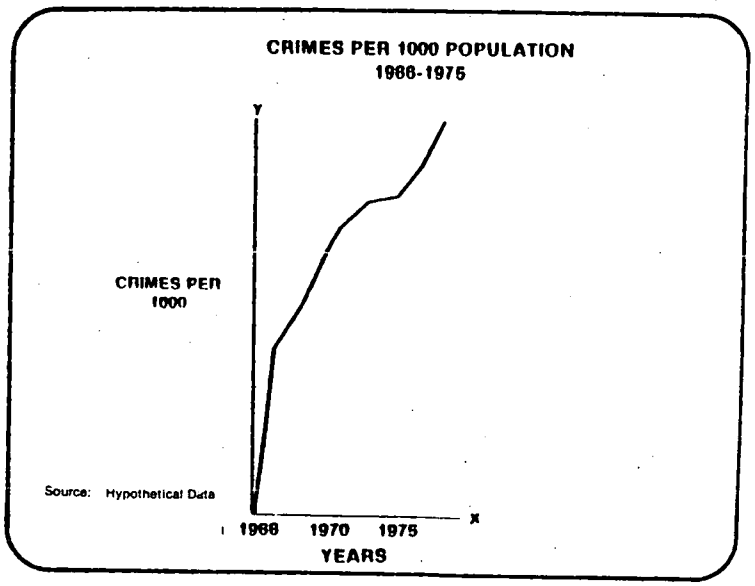
C. Distorting Graphical Presentations

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

V.A. (3-18):

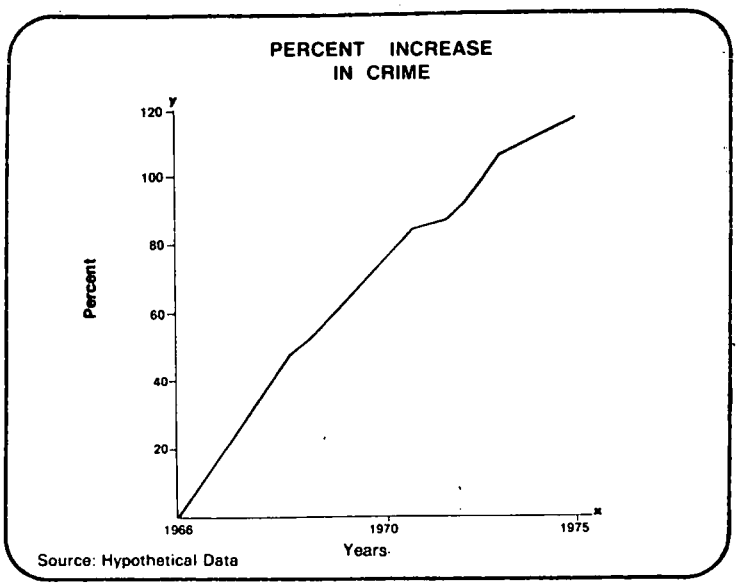


V.A. (3-19):



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

V.A. (3-20):

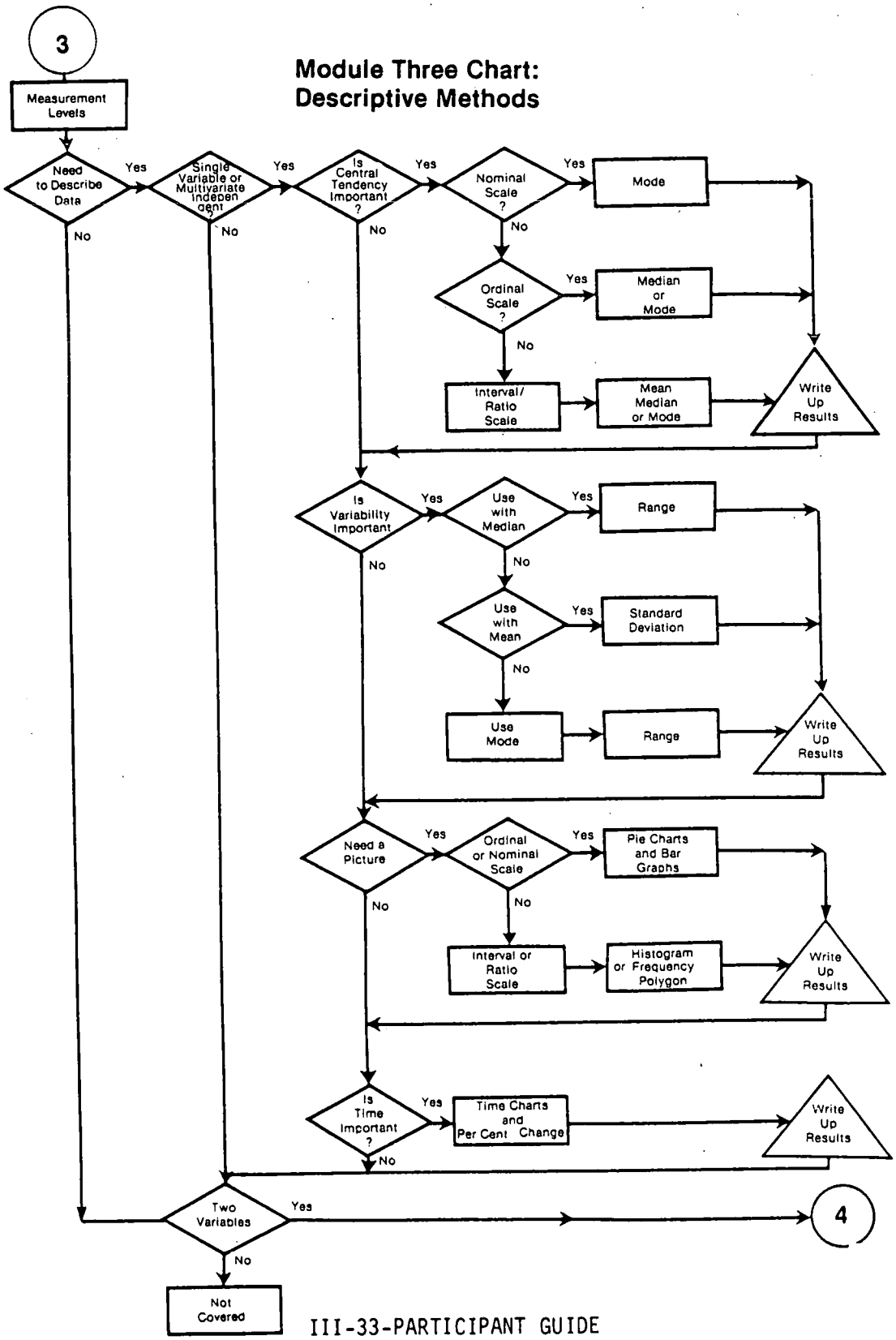


NOTES

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.

V.A. (3-21):


3
Module Three Chart:
Descriptive Methods
Measurement Levels
Need to Describe Data
Yes
No
Single Variable or Multivariate Independent
Yes
No
Is Central Tendency Important ?
Yes
No
Nominal Scale ?
Yes
No
Mode
Ordinal Scale ?
Yes
No
Median or Mode
Interval/ Ratio Scale
Mean Median or Mode
Write Up Results
Is Variability Important
Yes
No
Use with Median
Yes
No
Range
Use with Mean
Yes
No
Standard Deviation
Use Mode
Range
Write Up Results
Need a Picture
Yes
No
Ordinal or Nominal Scale
Yes
No
Pie Charts and Bar Graphs
Interval or Ratio Scale
Histogram or Frequency Polygon
Write Up Results
Is Time Important ?
Yes
No
Time Charts and Per Cent Change
Write Up Results
Two Variables
Yes
No
4
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.

NOTES

I. INDEX NUMBERS

A. An index number consists of a:

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

It is a ratio of two measures.

B. Rates.

+ 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.

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

NOTES

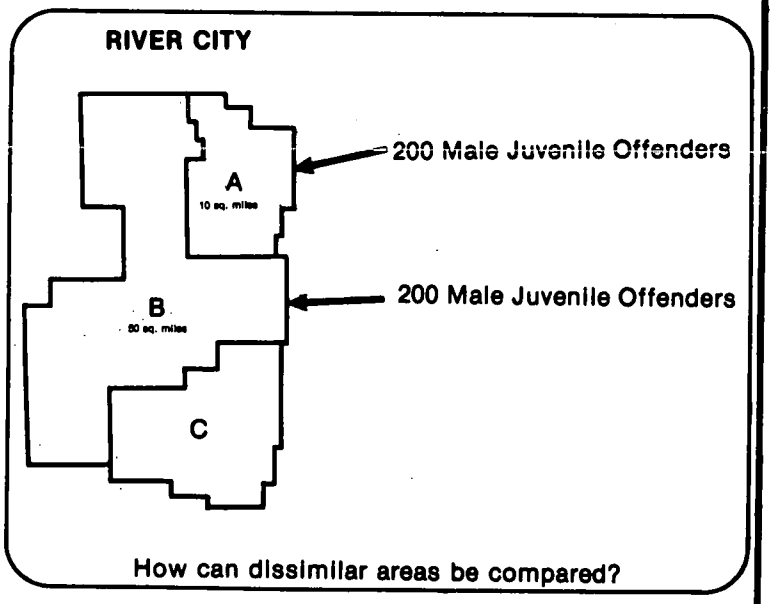
C. Four Types of Index Numbers

+ Density Index.

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

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

V.A. (4-1):

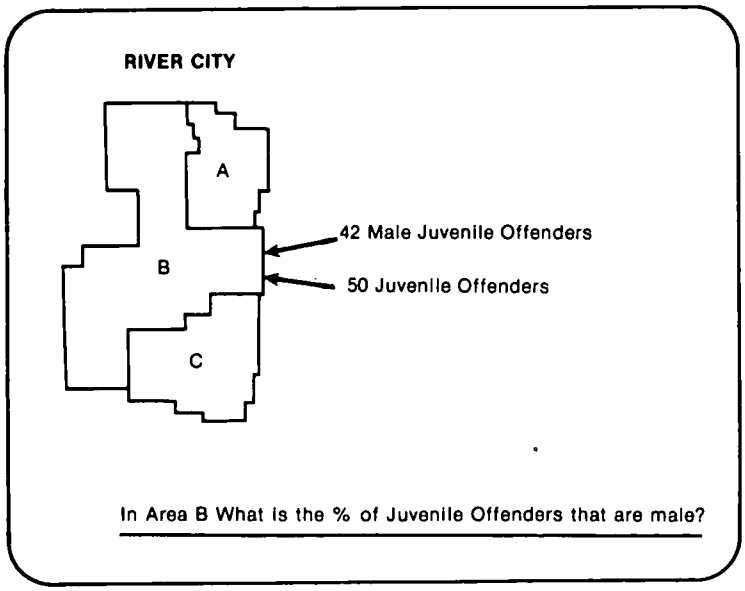


+ Concentration Index.

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

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

V.A. (4-2):



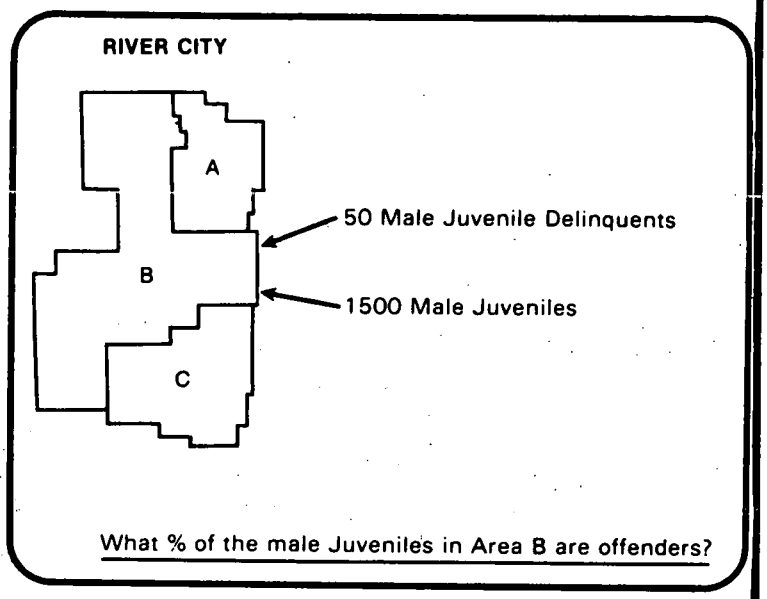
NOTES

+ Distribution Indices.

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

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

V.A. (4-3):

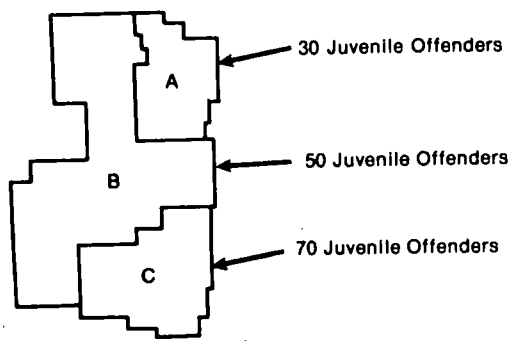


+ Index of Unit Share.

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

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

V.A. (4-4):



Area B Contains What % of the City's Juvenile Offenders?

NOTES

D. Comparative Analysis Using Index Numbers

+ Comparative analysis emphasizes the simultaneous assessment of crime data for many different jurisdictions.

+ Comparative analysis is often extended in two directions.

  - First, victimization data may be introduced.

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

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?

WALK-THROUGH 'F'

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

		FREQUENCY		RATE		FREQUENCY RANK		RATE RANK		SUM OF FREQ. RANKS	SUM OF RATE RANKS	COMBINED FREQUENCY RANK	COMBINED RATE RANK
CITY	POPULATION	BURGLARY	LARCENY	BURGLARY	LARCENY	BURG.	LARC.	BURG.	LARC.				
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

+ 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.

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

+ Crime types are not sufficient for the following reasons:

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

  - Seriousness weights are needed in a seriousness scale.

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

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

NOTES

B. An example of a Seriousness Scale: Sellin-Wolfgang Index.

+ 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.

+ The Sellin-Wolfgang index has three important characteristics:

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

  - 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.

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

+ 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.

C. Uses of seriousness scale.

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.

SERIOUSNESS

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.

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		236		109		146	
Victim Treated And Dis-charged	508	2032	612		756		797		730	
Victim Hospital-ized	169	1183	263		432		504		455	
$\sum$	1015	3553	1251		1424		1410		1331	

* SS= Seriousness Score

2. Calculate seriousness per incident:

Seriousness per Incident	1973	1974	1975	1976	1977
	3.50				

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

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

% change =

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

incident
rate
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.

B. Illustration of a one-way and two-way cross classification table.

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.

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

+ 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.

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

+ Cross classification is not concerned with strength or significance of association (covered in Module 5).

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.

WALK-THROUGH 'G'

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)		
	Employment Status of Ex-Offenders		
Recidivism Status	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.

	Employment Status of Ex-Offenders		
Recidivism Status	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

WALK-THROUGH 'G'

NOTES

IV. SCATTERGRAMS

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

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

+ 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.

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

SCATTERGRAM

PURPOSE

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

WALK-THROUGH 'H'

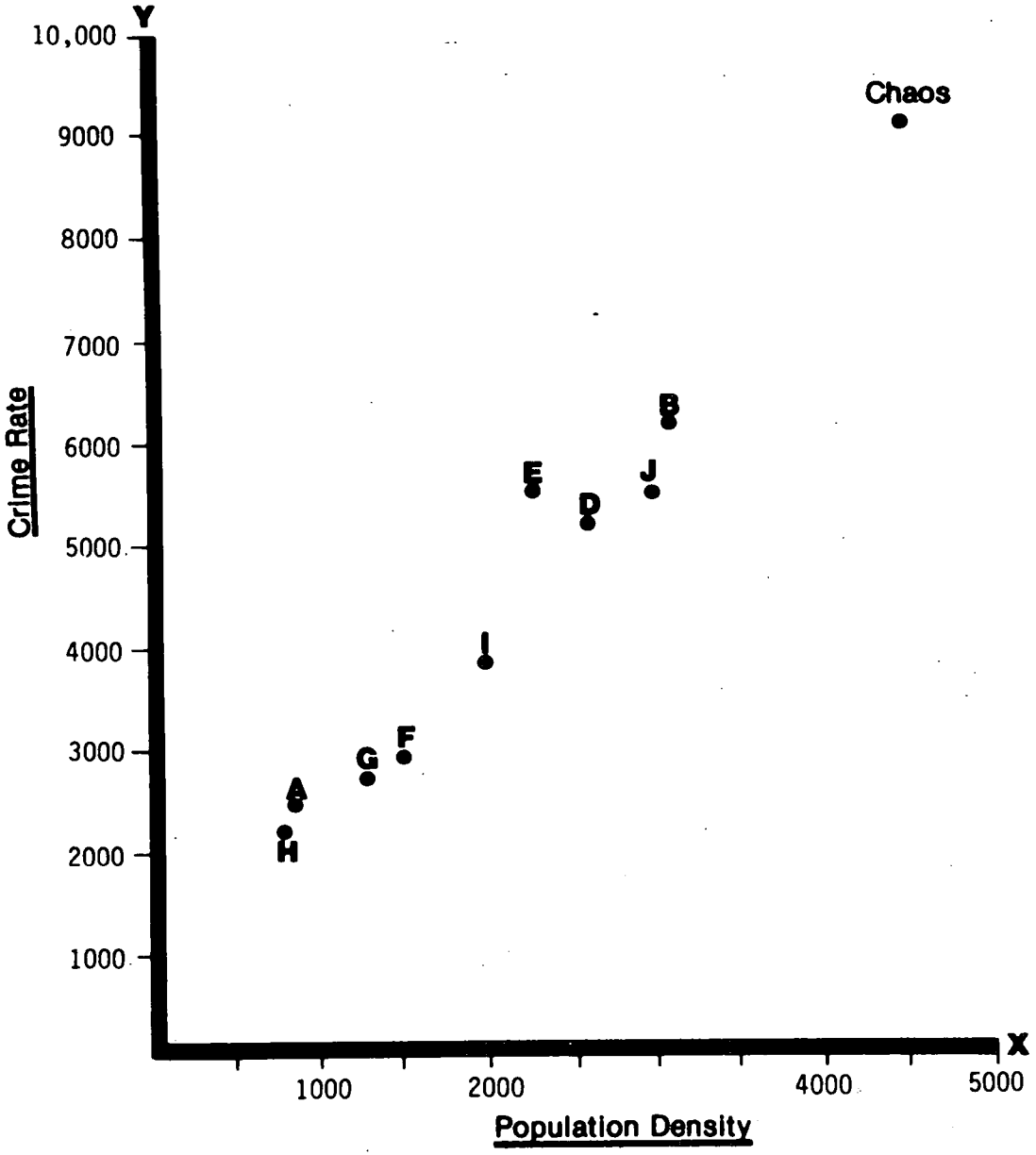


Table 1.

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

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

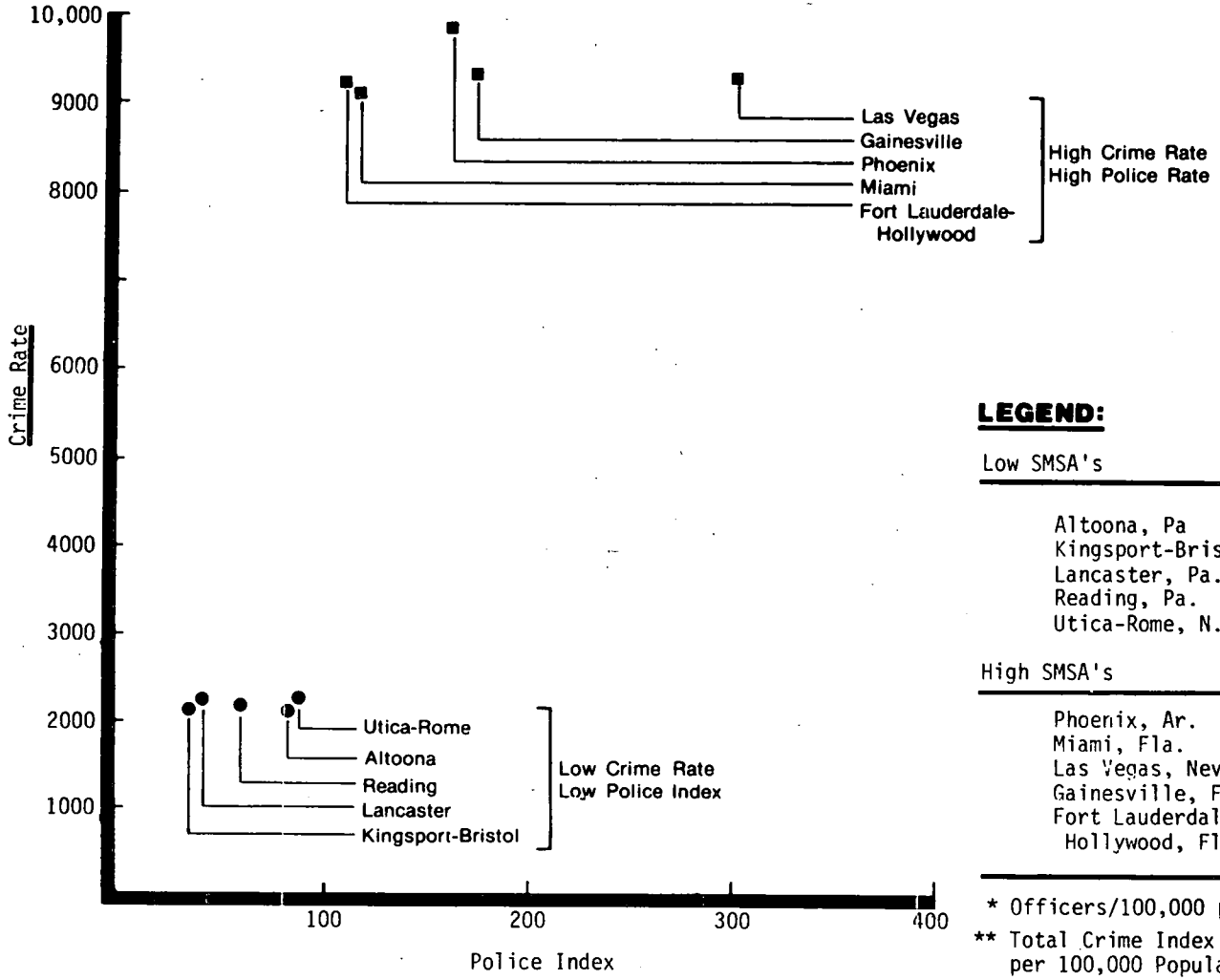
** Total Crime Index per 100,000 Population

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'

NOTES

V. Statistical Maps

A. Importance of Statistical Maps

B. Principles in Map Making

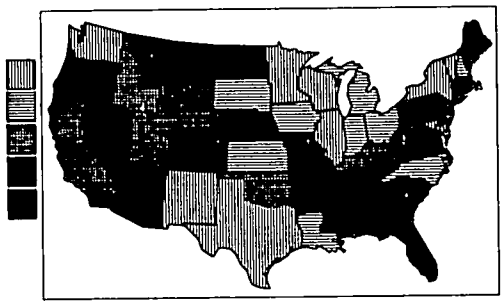
+ A small number of categories and shades to facilitate reading of the map.

+ Select appropriate geographical units to present.

V.A. (4-5):

Percent Change in Corrections Expenditures 1971-1974

The United States of America



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

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

NOTES

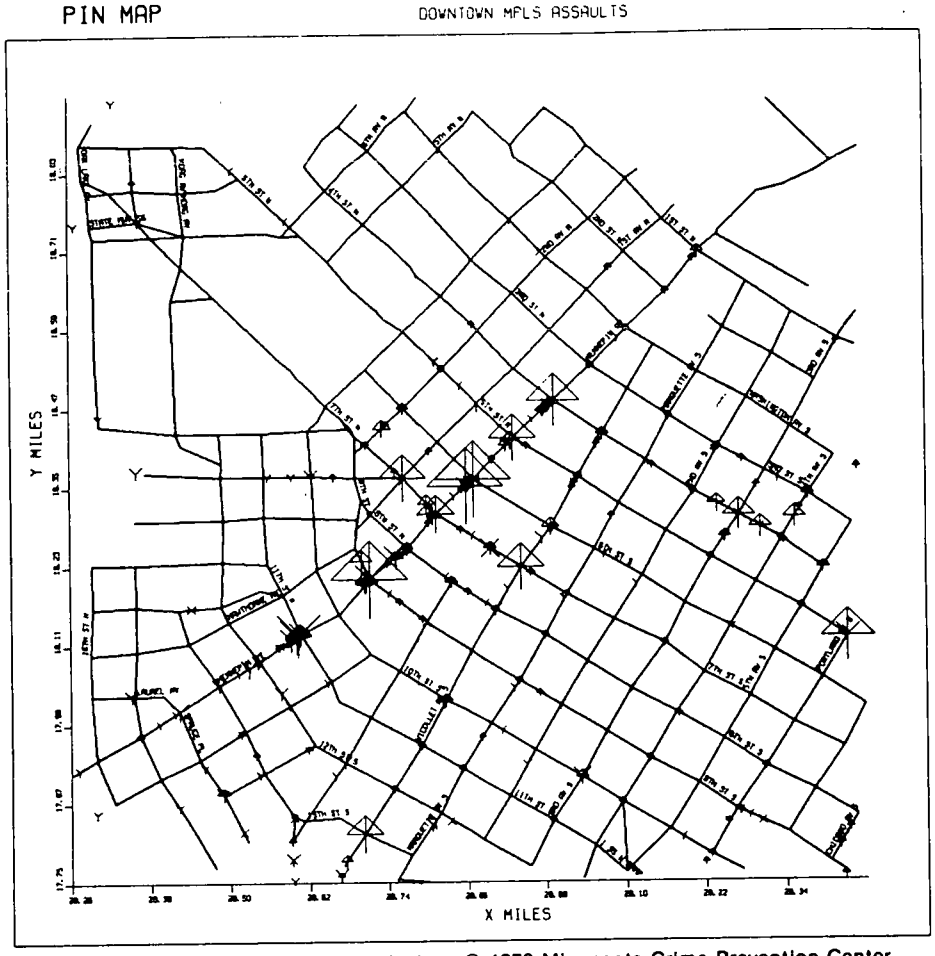
C. Spatial characteristics of crime

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

V.A. (4-6):

PIN MAP

DOWNTOWN MPLS ASSAULTS



CRIME SYMBOL KEY

DOWNTOWN MPLS ASSAULTS

SIZE INCREASES WITH NUMBER OF CRIMES

- X ASSAULT-SEXUAL
- ASSAULT-STRANGER
- Y ASSAULT-NONSTRANGER
- Y ASSAULT-OTHER

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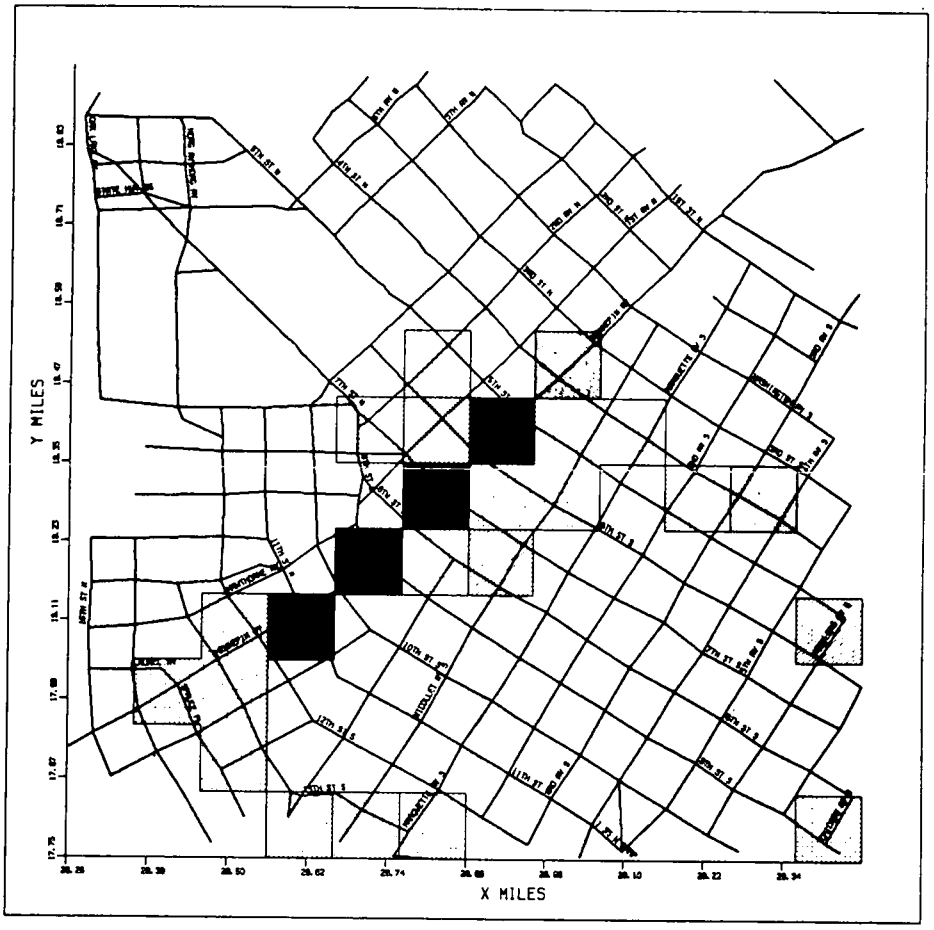
V.A. (4-7):

GRID MAP

DOWNTOWN MPLS ASSAULTS



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GRID KEY

DOWNTOWN MPLS ASSAULTS

GRID SIZE .0100 SQ MILES
EQUAL INTERVAL

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

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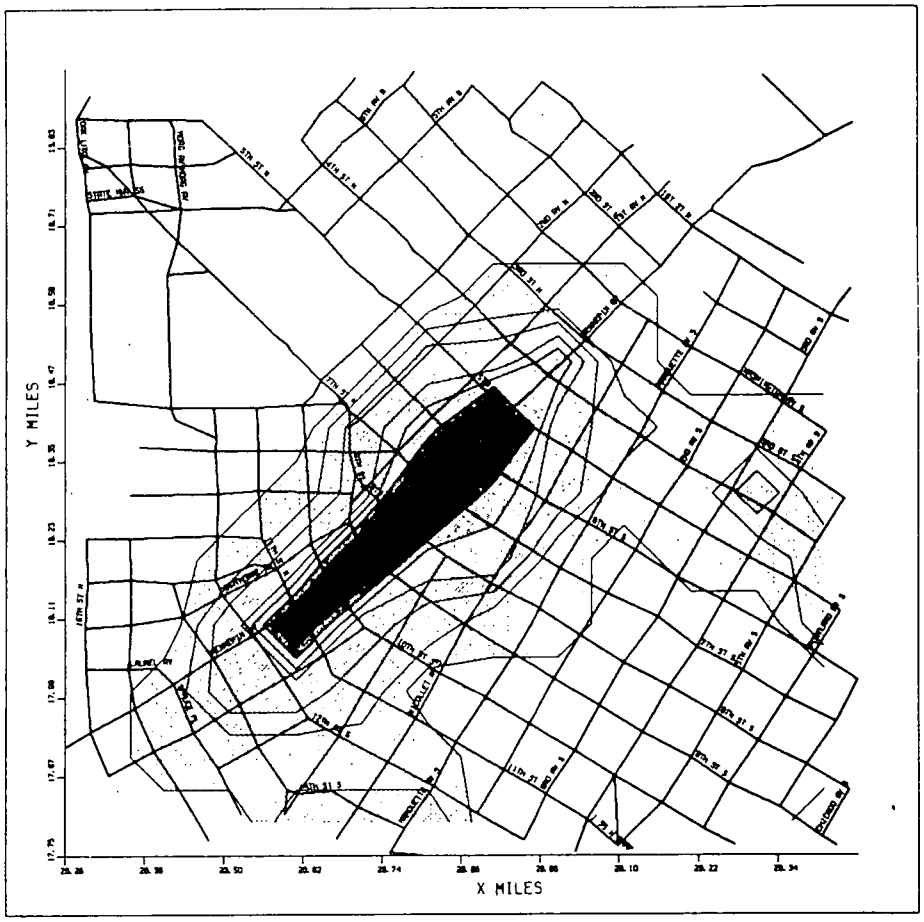
V.A. (4-8):

SMOOTHED CONTOUR MAP DOWNTOWN MPLS ASSAULTS



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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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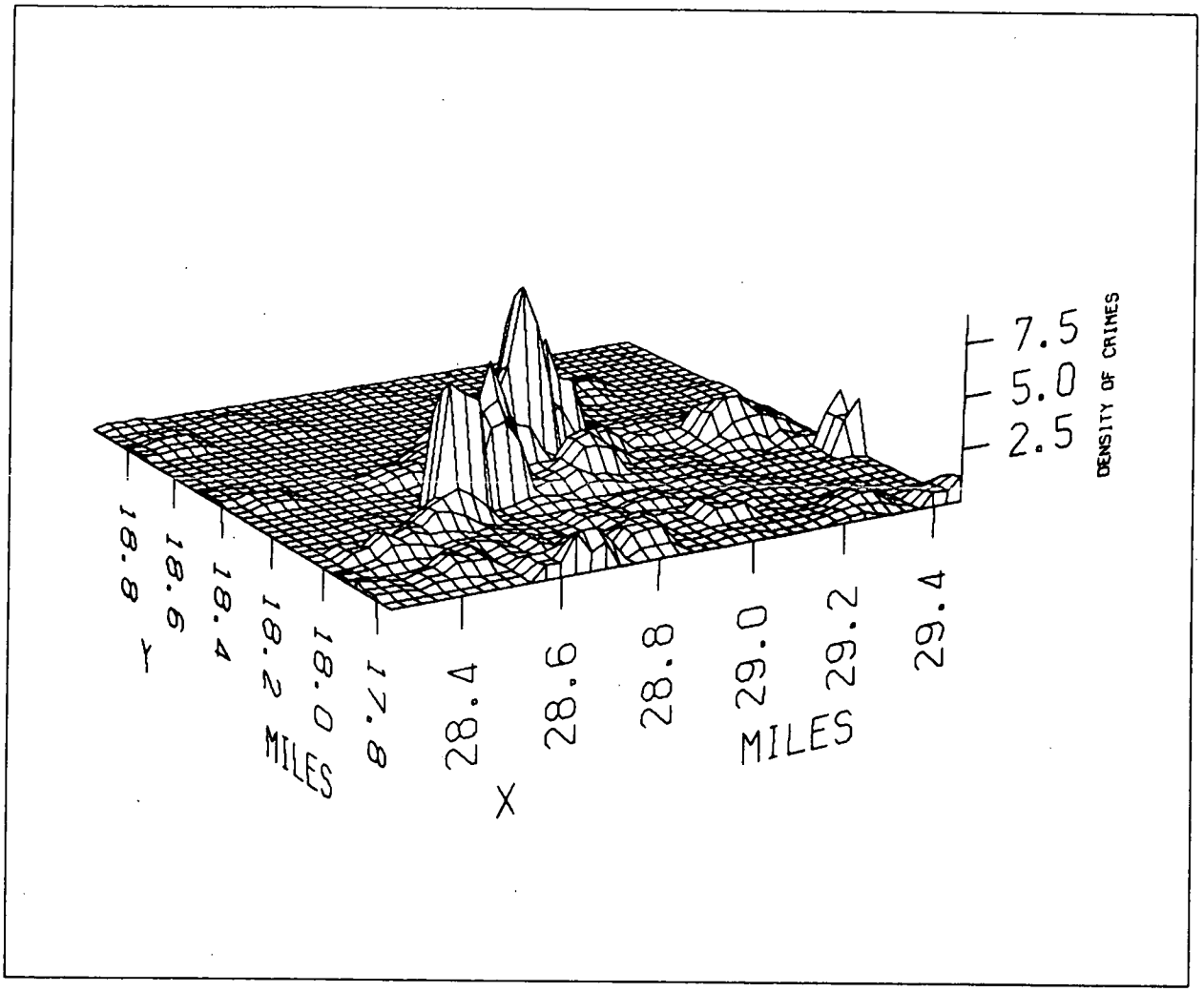
V.A. (4-9):

3D DENSITY PLOT

DOWNTOWN MPLS ASSAULTS



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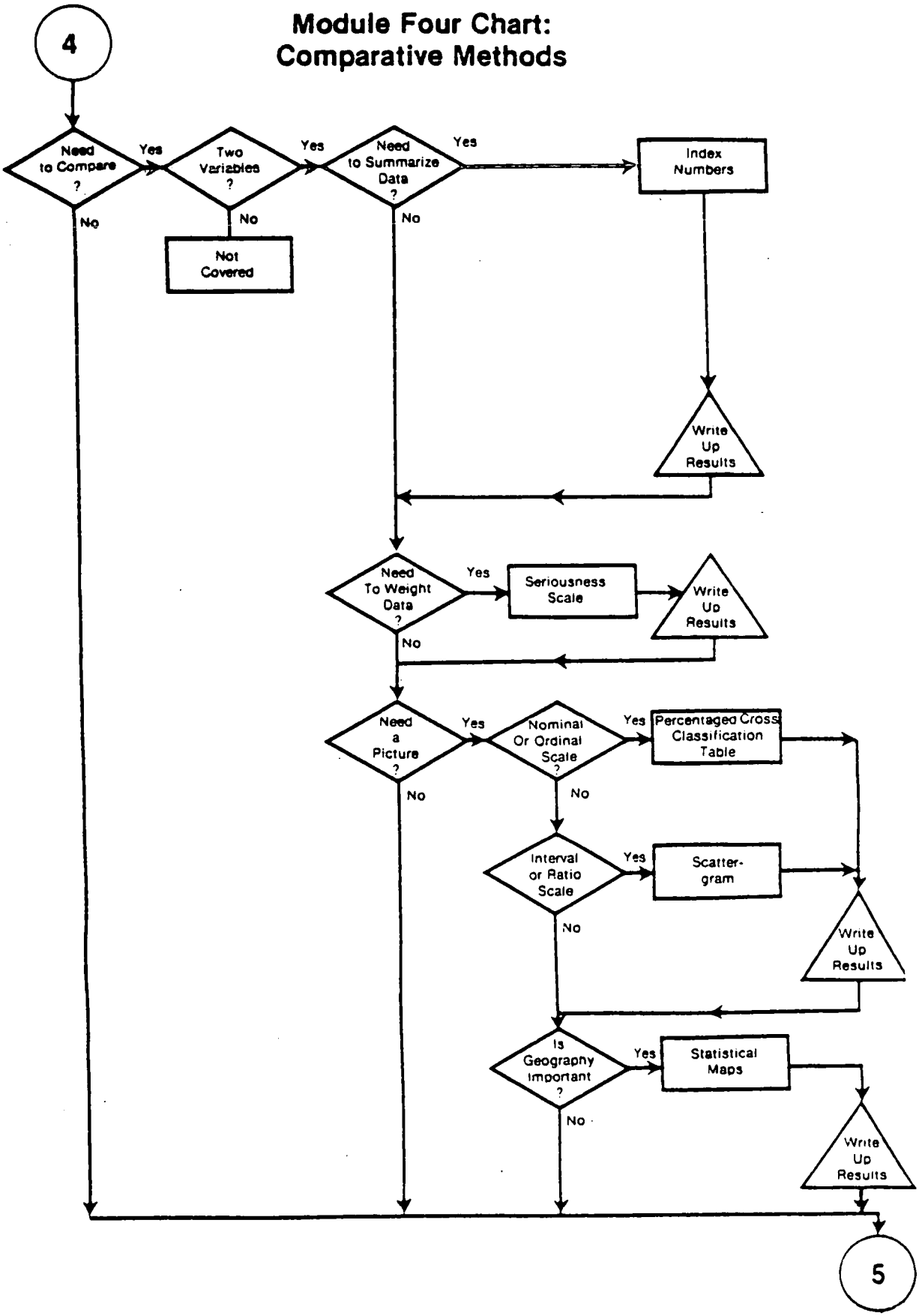
NOTES

VI. CONCLUSION

V.A. (4-10):


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

MODULE 5
INFERENTIAL METHODS

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

OBJECTIVES

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.

I. STATISTICAL TESTING

A. Definition:

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

  - Description involves summarizing masses of data to facilitate communication.

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

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

+ Samples and Inference

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

  - There are two issues when using a sample:

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

    How confident are we in our findings?

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

B. Statistical Tests.

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

+ The procedure is as follows:

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

+ 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.

+ Perhaps the greatest danger in applying measures of association is what is referred to as a "spurious" correlation.

II. CHI SQUARE TEST OF INDEPENDENCE

A. Uses.

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

+ It tests a null hypothesis of independent classifications.

+ It helps interpret cross classification tables.

B. Characteristics.

V.A. (5-2):

CHI SQUARE GENERAL CALCULATION FORMULA

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

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

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

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.

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_o: 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_o and H_a?

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.

WALK-THROUGH 'I'

WORKSHEET

A. State Null Hypothesis:

H_o: response independent of race

H_a: response and race are dependent

B. Calculate Expected Values:

$$E_1 = \frac{105\ (125)}{200} = 65.63$$

$$E_2 = \frac{105\ (75)}{200} = 39.38$$

$$E_3 = \frac{95\ (125)}{200} = 59.38$$

$$E_4 = \frac{95\ (75)}{200} = 35.63$$

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)

WALK-THROUGH 'I'

CHI SQUARE

PURPOSE

To give participants an opportunity to calculate and interpret a Chi Square statistic.

INSTRUCTIONS

You are to perform an analysis and interpretation of the results of a survey of the State of Paradise residents using a Chi Square Test of Independence.

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 X^2 statistics.

F. State your decision about H_0 and H_a, based on the X^2 test.

G. Write one or two sentences describing the results of your test on these data.

EXERCISE #3

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

EXERCISE #3

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.

WORKSHEET

A. Part One:

1. State Null and Alternative Hypotheses

H_0: crime trend is independent of area

H_a: they are dependent

2. Calculate Expected Values:

$E_1 = \frac{4578\ (3884)}{7962} = 2233.23$ $E_4=$

$E_2=$ $E_5=$

$E_3=$ $E_6=$

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					
3					
4					
5					
6					

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

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 χ^2 =

Calculated χ^2 =

EXERCISE #3

WORKSHEET (Continued)

B. Part Two:

1. State Null and Alternative Hypotheses

H_o:

H_a:

2. Calculate expected values.

$E_1 = \frac{(436)\ (498)}{879} = 247.02$

E_2=

E_3=

E_4=

E_5=

E_6=

E_7 =

E_8=

E_9=

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					
3					
4					
5					
6					
7					
8					
9					

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

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

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

Table χ^2 =

Calculated χ^2 =

EXERCISE #3

III. CORRELATION COEFFICIENT

A. Uses

+ The correlation coefficient is a measure of association which describes the degree to which one interval or ratio scale variable is related to another.

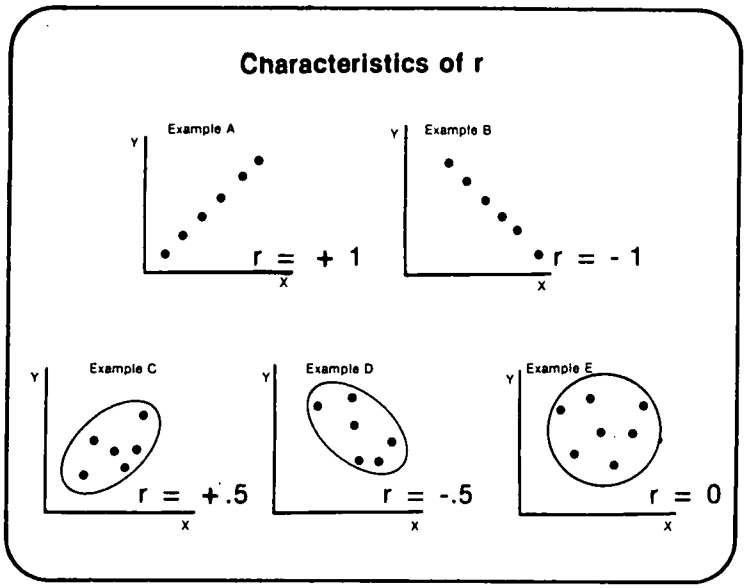
+ Indicates the nature of strength of a relationship between two variables.

+ Reflects the shape of a distribution.

+ Correlation coefficient helps to interpret scattergrams.

B. Characteristics

V.A. (5-5):



C. Calculating r

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

D. Testing the Significance of r

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.

E. Limitation:

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

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

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

+ 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.

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.

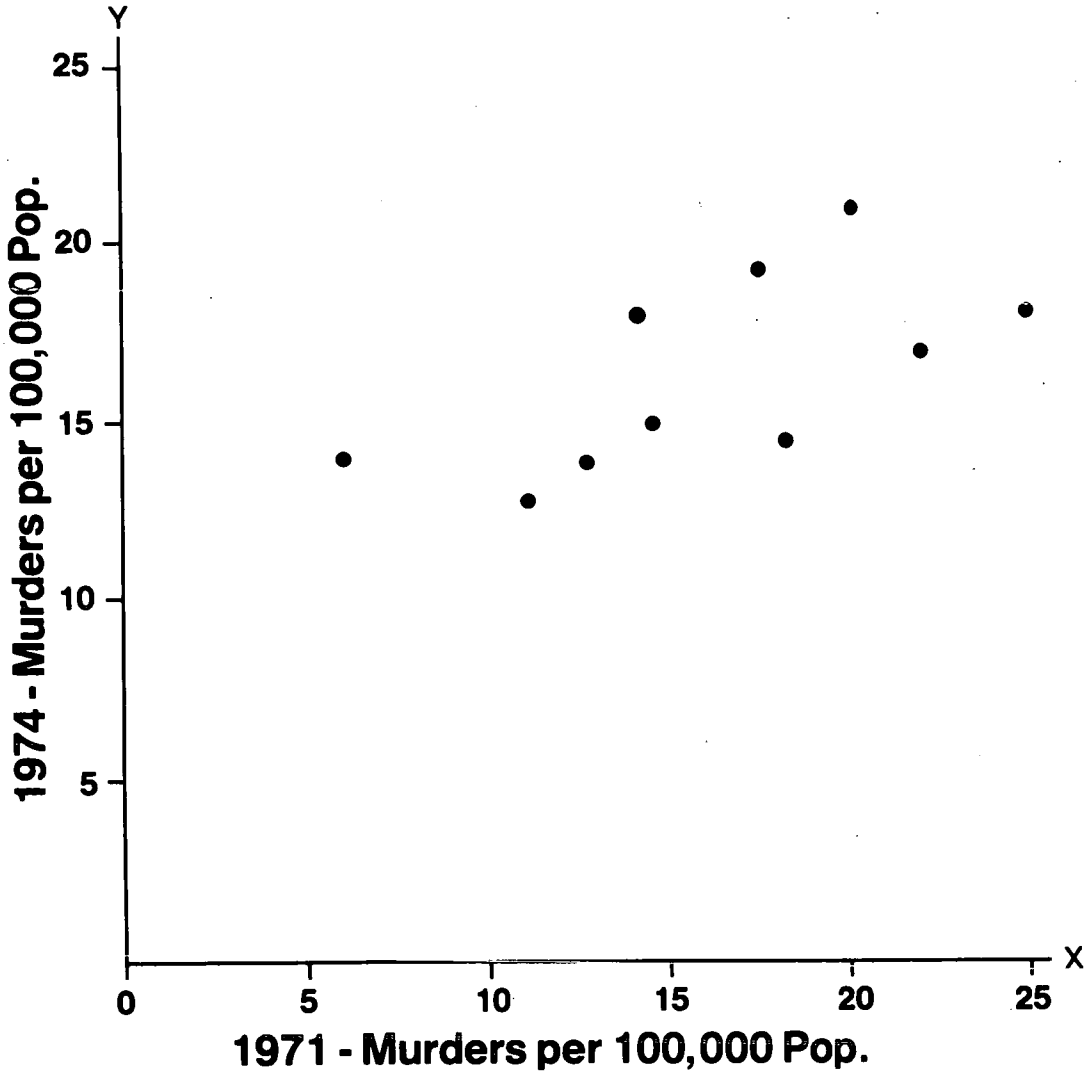
Sources: Sourcebook, 1976; also, Mendenhall, Ott and Larson. Statistics for the Social Sciences, 1975.

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.)

EXERCISE #4

DATA SET

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

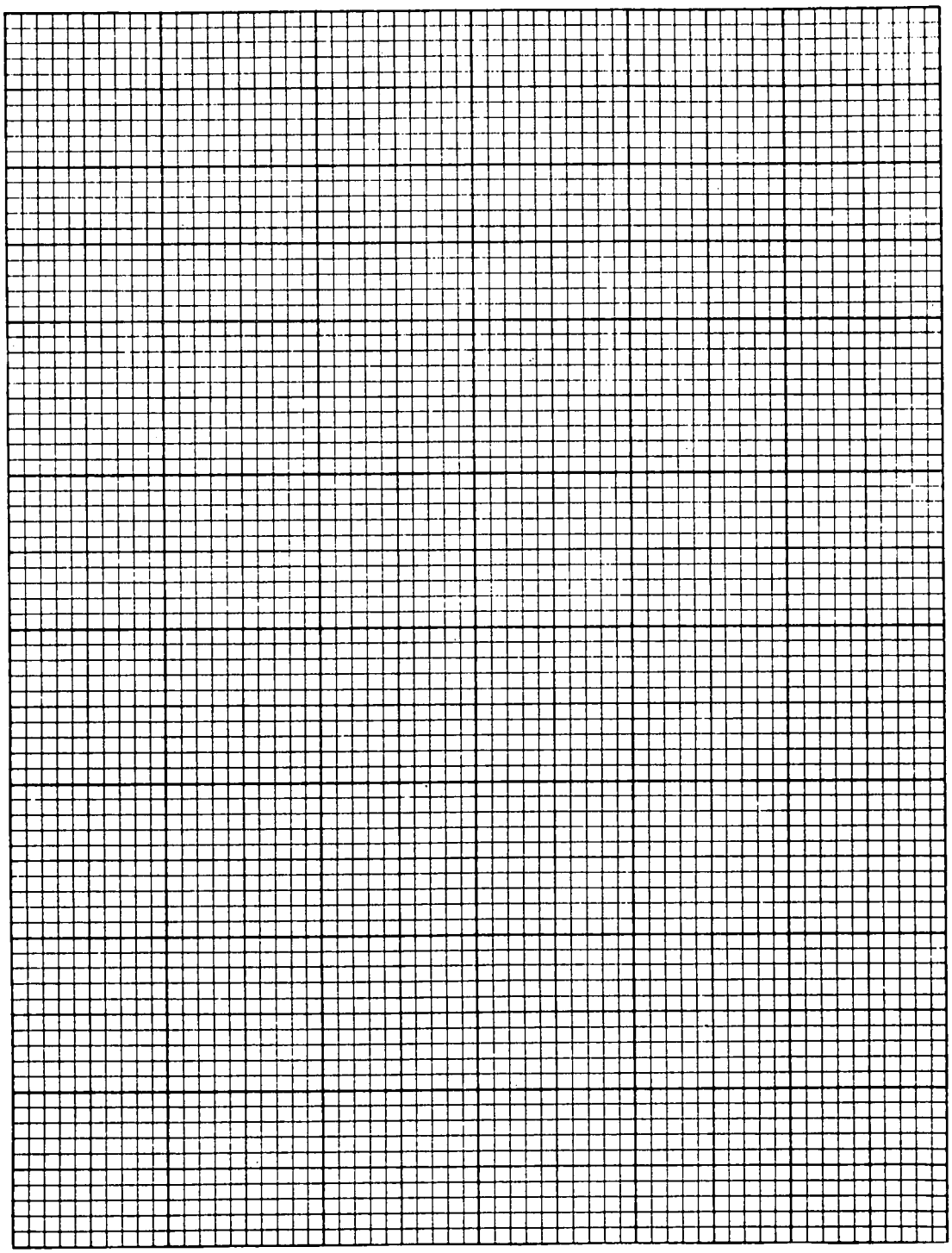
COUNTY	POPULATION PER SQ. MILE 7-1-77	REPORTED LARCENY OFFENSES
1. Alachua	146	5,740
2. Duval	748	21,645
3. Hillsborough	581	25,040
4. Orange	467	17,920
5. Polk	151	10,750
6. Leon	202	5,495
7. Volusia	206	11,700
8. Seminole	466	2,930
9. Escambia	345	10,215
10. Sarasota	291	5,840
11. Brevard	252	9,085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

Source: FBI, UCR, 1978

EXERCISE #4

WORKSHEET

A. Prepare a scattergram.



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			
3	581	250			
4	467	179			
5	151	108			
6	202	55			
7	206	117			
8	466	29			
9	345	102			
10	291	58			
11	252	91			
12	220	48			
13	250	208			
$\sum$					

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 =

D. Test Significance (d.f. = n-2 = α = .05, r =)

EXERCISE #4

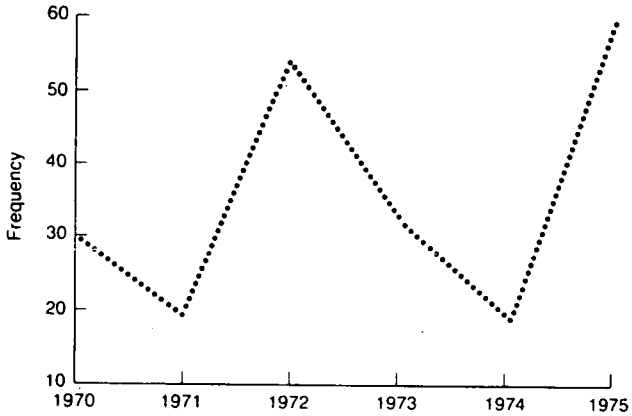
NOTES

IV. REGRESSION

A. Time Series Data

V.A. (5-8):

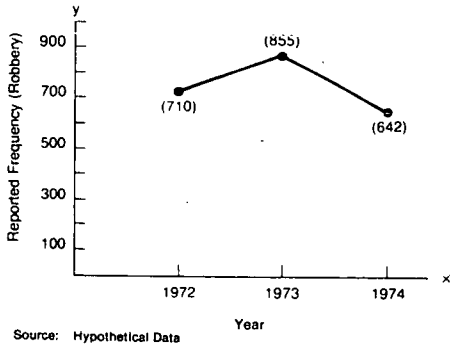
HOMICIDE: FIVE-YEAR TREND FOR CHAOS CITY, 1970–1975



Source: Hypothetical Data

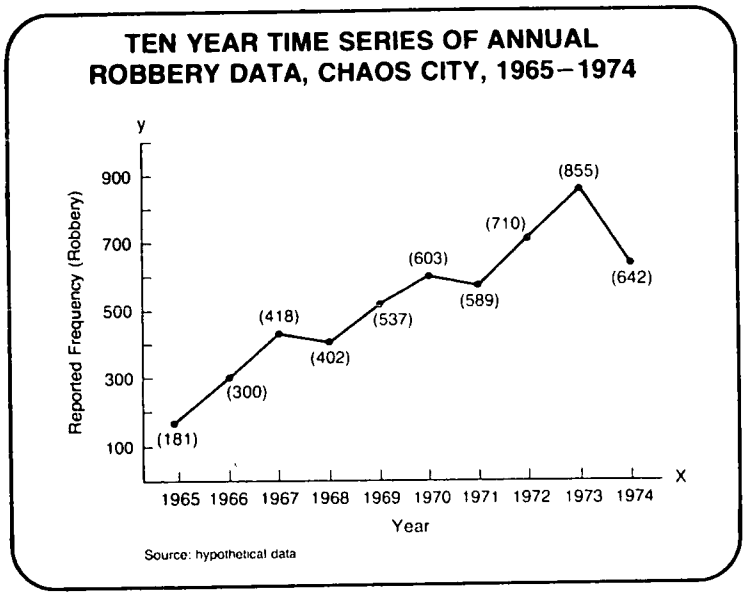
V.A. (5-9):

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

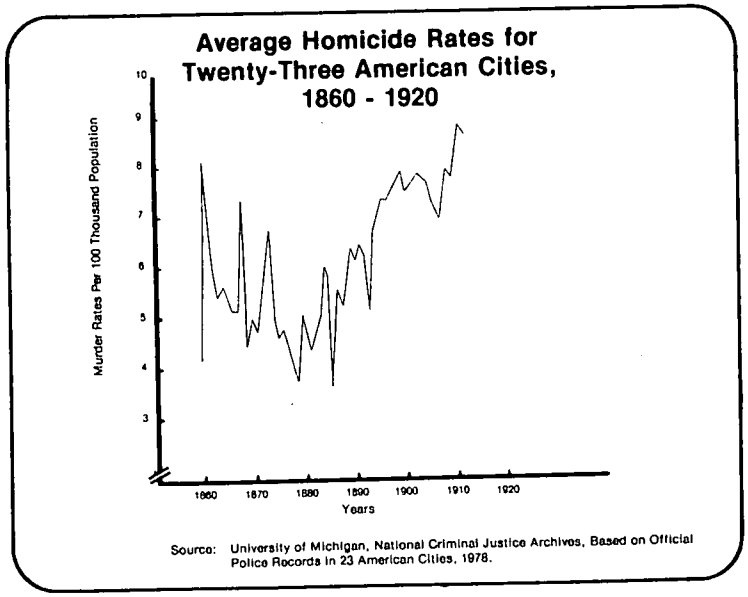


Source: Hypothetical Data

V.A. (5-10):


TEN YEAR TIME SERIES OF ANNUAL ROBBERY DATA, CHAOS CITY, 1965–1974
y
900
700
500
300
100
Reported Frequency (Robbery)
(181)
(300)
(418)
(402)
(537)
(603)
(589)
(710)
(855)
(642)
1965 1966 1967 1968 1969 1970 1971 1972 1973 1974
X
Year
Source: hypothetical data

V.A. (5-11):


Average Homicide Rates for Twenty-Three American Cities, 1860 - 1920
10
9
8
7
6
5
4
3
Murder Rates Per 100 Thousand Population
1860 1870 1880 1890 1900 1910 1920
Years
Source: University of Michigan, National Criminal Justice Archives, Based on Official Police Records in 23 American Cities, 1978.

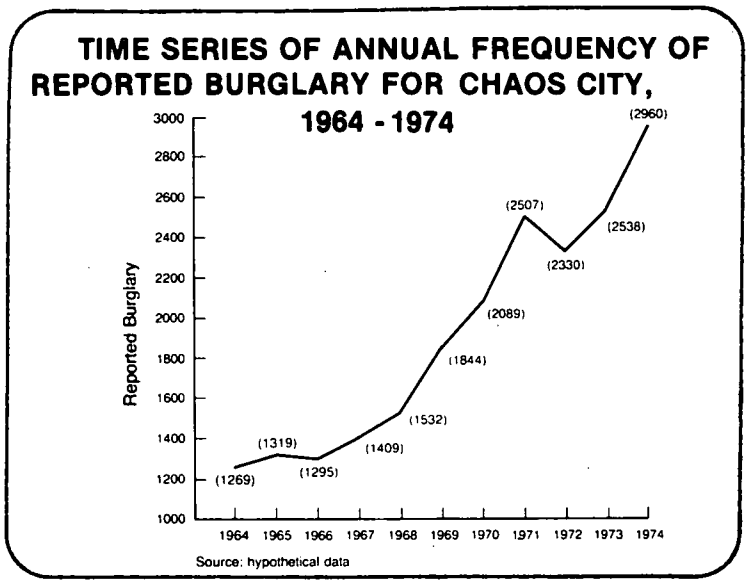
B. Visual Estimation of Regression Line.

+ Procedures.

- The first step is to fit a straight line through the time series which minimizes the distance between the data and the line.

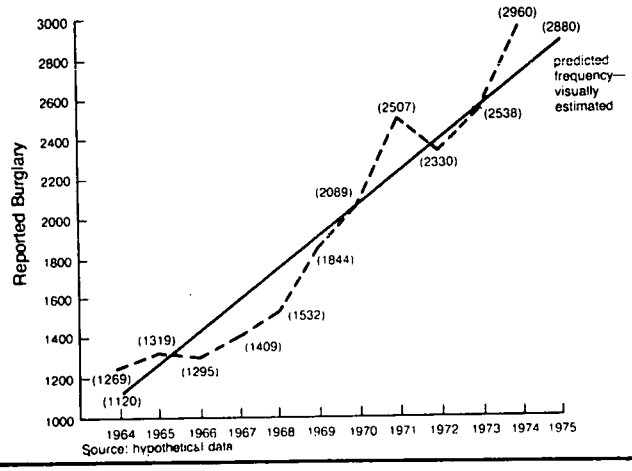
- Step two is to extend the line and "read" the resulting point estimate of a future value for the measure.

V.A. (5-12):



V.A. (5-13):

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



Source: hypothetical data

NOTES

C. Least Squares Regression

+ Purpose

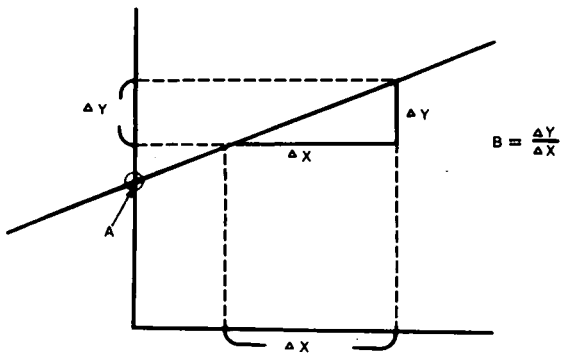
  - To aid in forecasting where there are trends in time series data.

  - To measure "best fit" for an estimating line.

+ Procedure for algebraically determining a straight line:

V.A. (5-14):

Slope and Y-Intercept



V.A. (5-15):

FORMULA FOR REGRESSION COEFFICIENTS

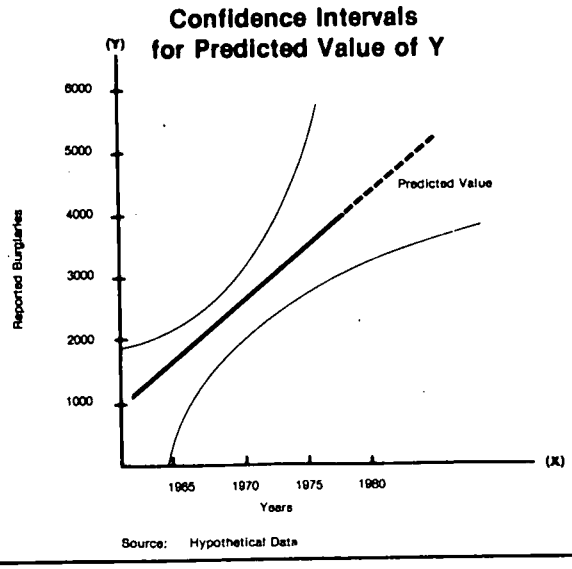
Step 1: $$B = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{N\Sigma X^2 - (\Sigma X)^2}$$

Step 2: $$A = \frac{\Sigma Y - B\Sigma X}{N}$$

Step 3: $$\hat{Y} = A + BX$$

+ Assessing the Utility and Accuracy of a Least Squares Prediction

V.A. (5-16):



REGRESSION

PURPOSE

To give participants the opportunity to make projections using linear regression.

INSTRUCTIONS

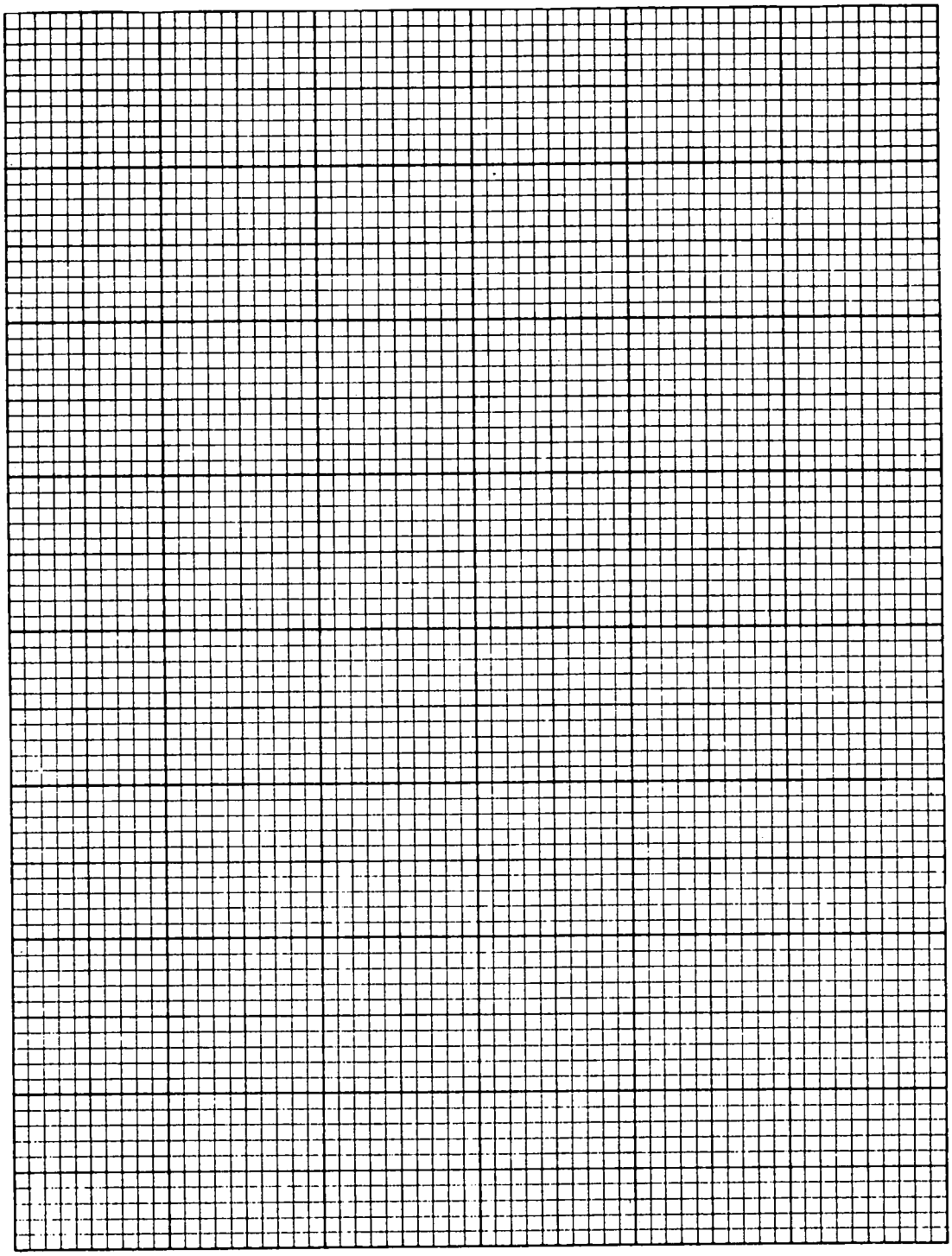
A. Using only a ruler and the provided graph paper, visually estimate 1978 and 1979 homicides for Chaos City.

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.

EXERCISE #5



EXERCISE #5

DATA SET

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		
2	13		
3	12		
4	14		
5	15		
6	18		
7	20		
8	25		
9	23		
10	25		
11	29		
Σ			

B. Calculate the slope (B)

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

B =

B =

EXERCISE #5

WORKSHEET Continued:

C. Calculate the Y intercept (A)

$$A = \frac{\Sigma Y - B(\Sigma X)}{N}$$

D. Substitute calculated values of A and B in equation.

$$\hat{y} = A + BX$$

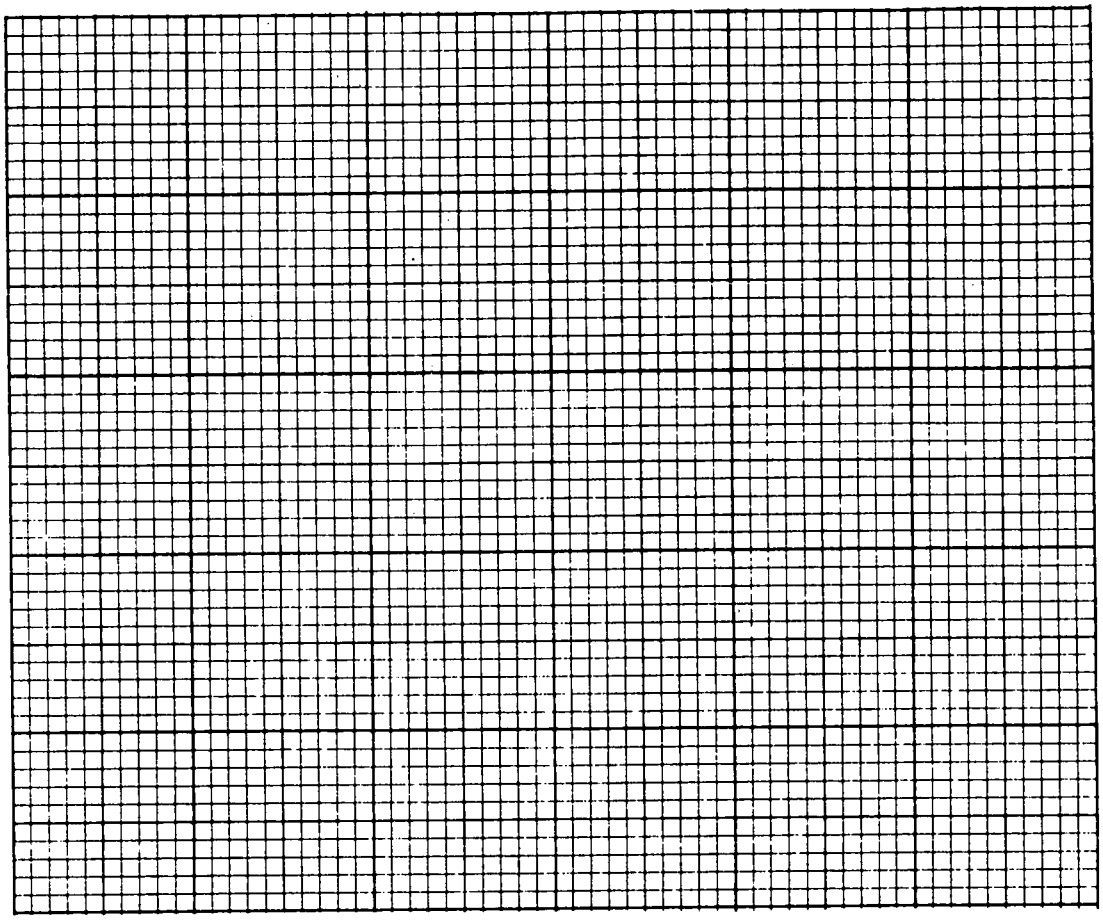
E. Substitute two arbitrary values of x into the equation and plot the line.

1. X $\hat{Y}$

2. Now plot the line on graph paper.

EXERCISE #5

WORKSHEET Continued:



EXERCISE #5

F. Estimate 1979 predicted homicide rate:

1. If 1978 = 12

   1979 =

2. $\hat{Y}_{78}$=

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

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

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

NOTES

V. INTERPRETATION OF FINDINGS

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

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

V.A. (5-17)

Each Problem Provides

- Questions
- Concepts and Measures
- Statistics

You Provide:

- Answers
- Interpretations
- Limitations
- Other Factors

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.

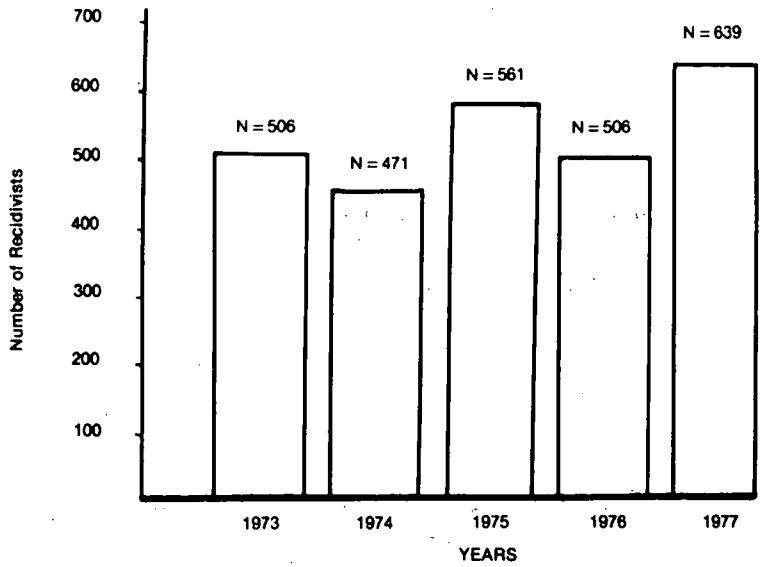
EXERCISE #6

DATA SET

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

Table 2.

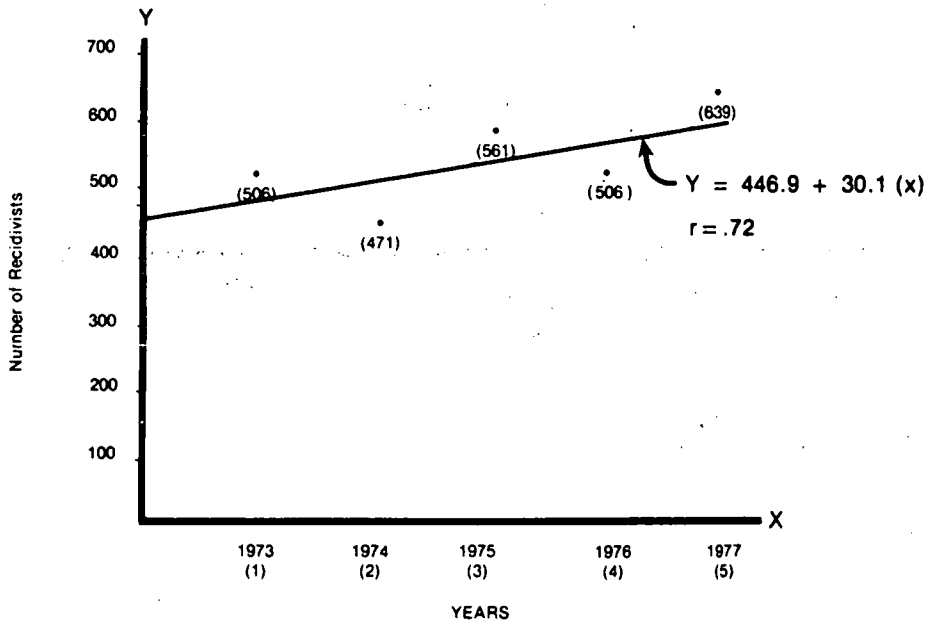
Number of Recidivists Per Year



Source: Chaos City Dept. of Corretions, 1978.

Table 3.

Number of Recidivists Per Year



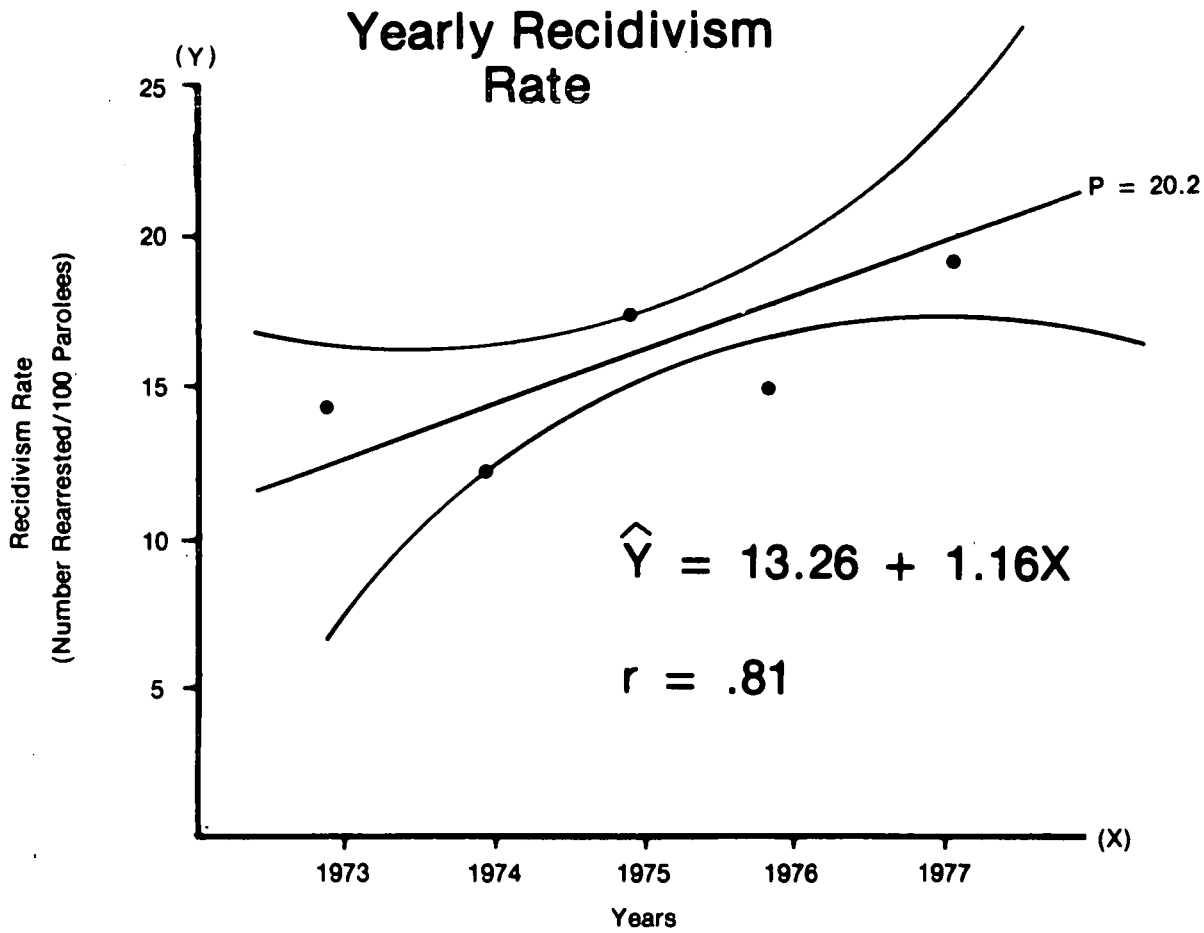
Source: Chaos City Dept. of Corrections

EXERCISE #6

DATA SET

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

Table 4.



Source: Chaos City Dept.
of Corrections, 1978.

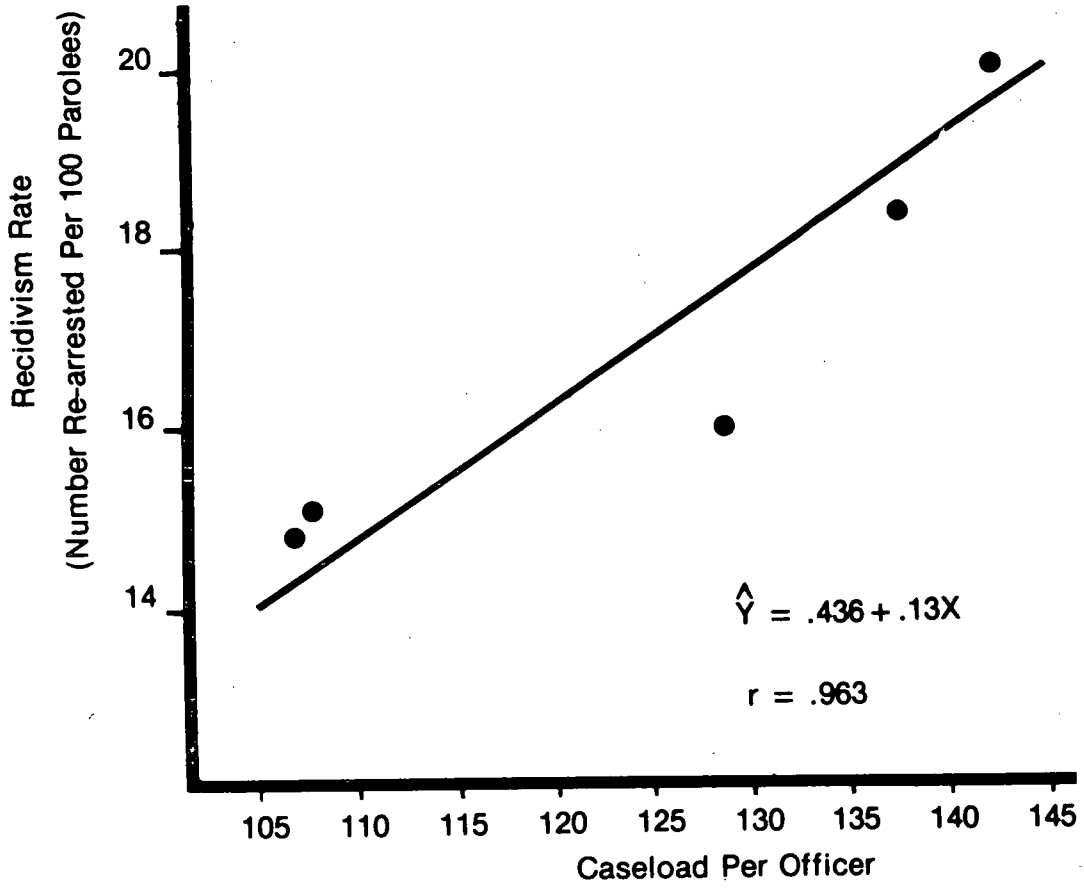
EXERCISE #6

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

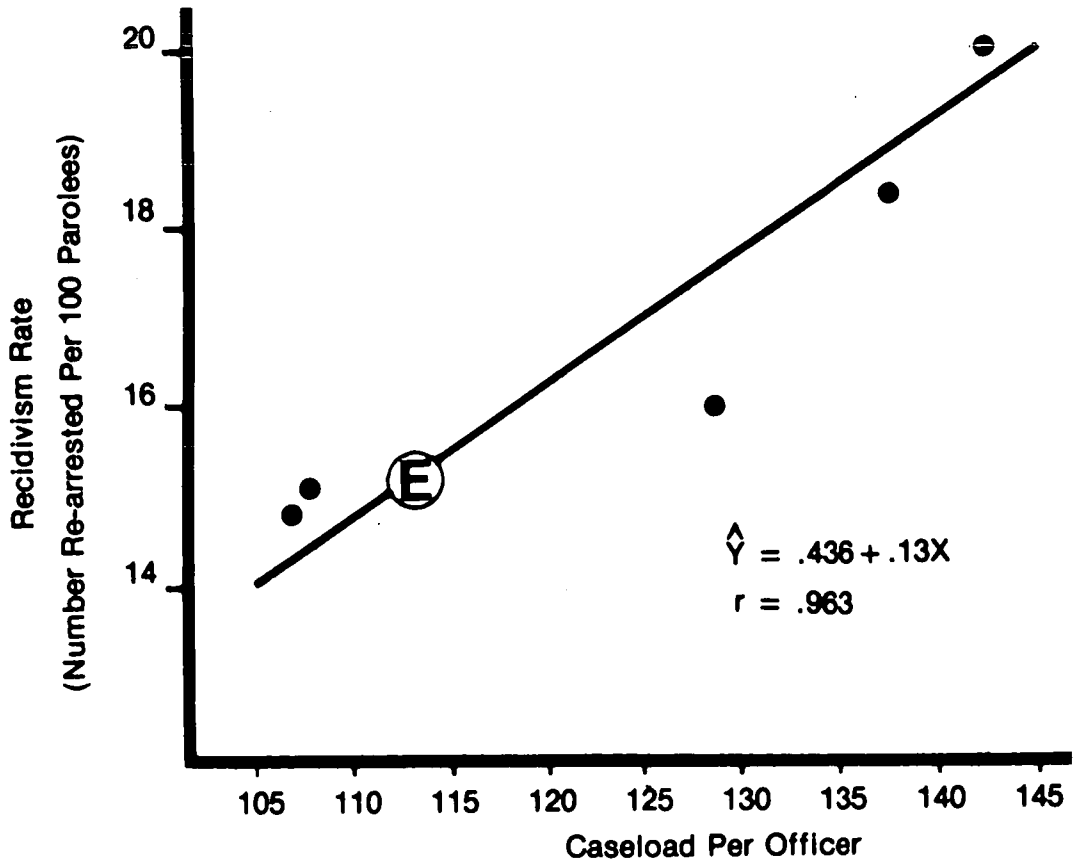
EXERCISE #6

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, 2df.) = 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

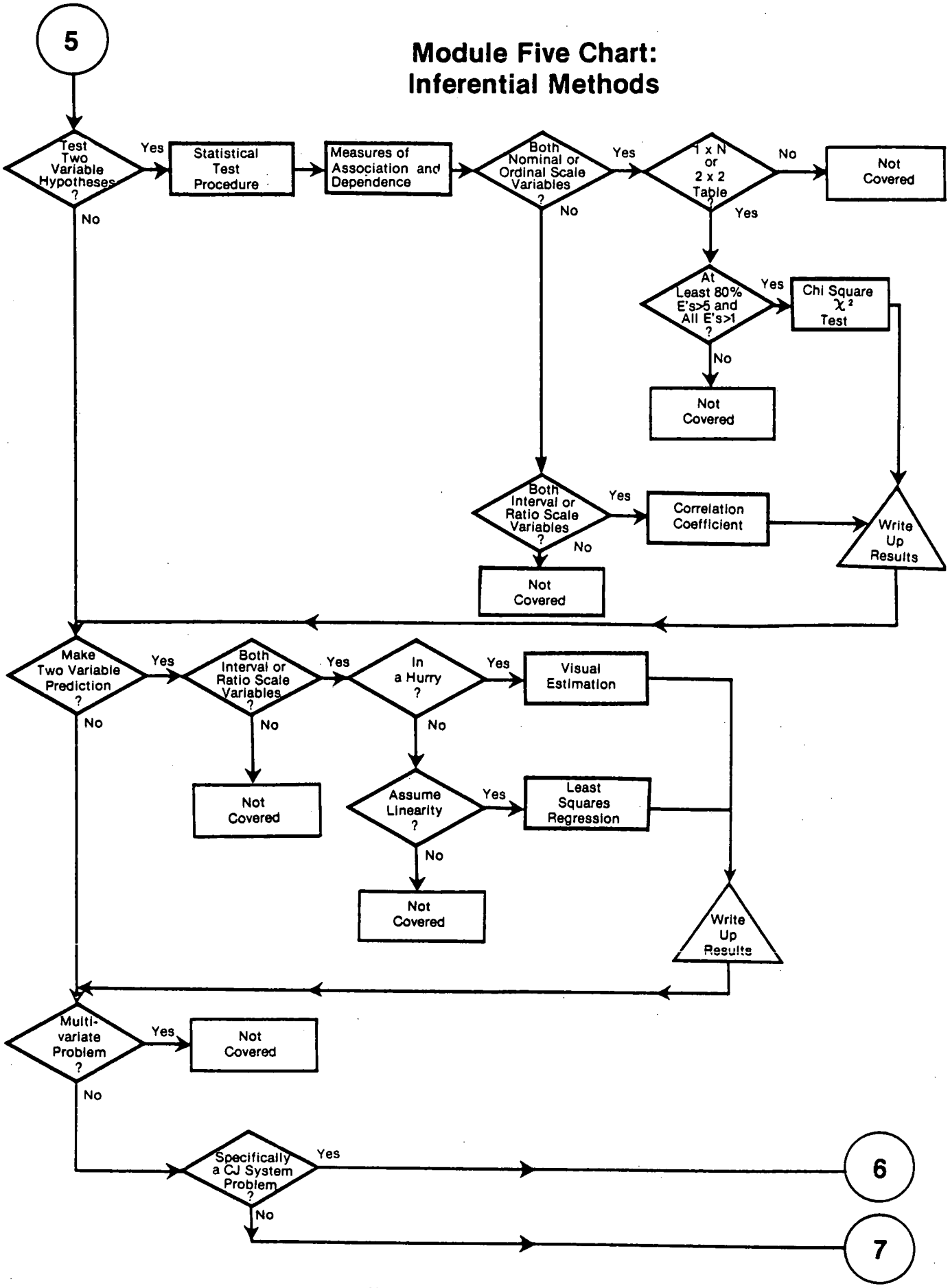
2. Limitations/Qualifications

3. Other Factors

EXERCISE #6

VI. CONCLUSION

Module Five Chart: Inferential Methods



WORKSHOP

Introduction to the Advanced Calculator

The purpose of this workshop is to introduce the use of an advanced hand calculator as an exploratory and labor saving tool in the analysis process. Specifically, this workshop covers basic operations, statistical operations and the programming capability of the TI55 calculator.

WORKSHOP ADVANCED CALCULATOR

I. BASIC OPERATIONS

A. Arithmetic Operations

Calculate each of the following:

1. 2930 + 5740 =
2. 2930 - 5740 =
3. 2930 ÷ 5740 =
4. 2930 x 5740 =
5. 2930^2 =
6. $\sqrt{2930}$ =

PRESS	DISPLAY	COMMENT
[CLR]	0	Clears Machine
2930 [+]	2930.	Enter Data
5740 [=]	8670.	The Result of the Addition
[CLR]	0	
2930 [-]	2930.	Enter Data
5740 [=]	-2810.	The result of Subtraction
[CLR]	0	
2930 [÷]	2930.	Enter Data
5740 [=]	0.510453	The Result of Division
[CLR]	0	
2930 [x]	2930.	Enter Data
5740 [=]	16818200.	The Result of Multiplication
[CLR]	0	
2930 [X2]	8584900.	The Result of Squaring
[CLR]	0	
2930 [√X]	54.129474	The Resulting Square Root

B. Parentheses and Fixed Decimal Control

Calculate to three decimal places the following:

$$\frac{(3X4) + (9X -2)}{\sqrt{(4 + 2) X .5}} =$$

PRESS	DISPLAY	COMMENT
[CLR]	0	
[2nd] [FIX] 3	0.000	Fixes All Subsequent Results at 3 Decimal Places
[(] [(] 3 [X] 4 [)]	12.000	(3X4) Displayed
[+] [(] 9 [X] 2 [+/-] [)] [)]	-6.000	Value of Numerator
[÷] [(] [(] 4 [+] 2 [)]	6.000	(4+2) Displayed
[X] [.] 5 [)]	3.000	(6X.5) Displayed
[√X]	1.732	Value of Denominator
[=]	-3.464	The Result

C. Percent Change

If the homicide rate in Chaos City in 1970 was 14 and the rate in 1977 was 29, what was the percent change in the homicide rate?

PRESS	DISPLAY	COMMENT
CLR	0	
2nd FIX 2	0.00	Set 2 Decimal Places
29 2nd Δ%	29.00	Enter Most Recent Year First
14 =	107.14	Percent Change

D. Constants

The total number of robberies in 1977 for five cities in the State of Paradise was 5130, 4920, 3170, 9200 and 4301. What was the average monthly number of robberies in each city?

PRESS	DISPLAY	COMMENT
CLR		
2nd FIX 0	0	Rounds to Nearest Integer
12 ÷ 2nd const	12	Divides Each Subsequent Entry by 12
5130 =	428.	Average Monthly Number of Robberies in the Five Cities
4920 =	410.	
3170 =	264.	
9200 =	767.	
4301 =	358.	

WORKSHOP ADVANCED CALCULATOR

II. STATISTICAL OPERATIONS

A. Mean and Standard Deviation

Describe the incidence of reported larcenies for the 13 Florida counties presented in Table 1.

PRESS	DISPLAY	COMMENT
[2nd] [CA]	0	Clears Entire Machine
[2nd] [FIX] 2	0.00	Set Decimal to 2 Places
5740 [Σ+]	1.00	Enter First Data Point; Calculator Counts and Displays The Data Points
21645 [Σ+]	2.00	
25040 [Σ+]	3.00	
17920 [Σ+]	4.00	
10750 [Σ+]	5.00	
5495 [Σ+]	6.00	
11700 [Σ+]	7.00	
2930 [Σ+]	8.00	
10215 [Σ+]	9.00	
5840 [Σ+]	10.00	
9085 [Σ+]	11.00	
4775 [Σ+]	12.00	
20830 [Σ+]	13.00	
[2nd] [MEAN]	11689.62	Mean
[2nd] [S DEV]	7314.83	Standard Deviation
[RCL] 5	151965.00	Total Number of Larcenies
[RCL] 7	13.00	Number of Counties

TABLE 1. REPORTED LARCENY BY POPULATION DENSITY FOR THIRTEEN FLORIDA COUNTIES, 1977

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

Source: FBI, UCR, 1978

B. Linear Regression

Discuss the relationship between population density and reported larcenies (See Table 1).

PRESS	DISPLAY	COMMENT
[2nd] [CA]	0	
[2nd] [FIX] 2	0.00	
146 [X⇄Y]	0.00	Enter First X Value
5740 [Σ+]	1.00	Enter First Y Value
748 [X⇄Y]	147.00	Enter X_2
21645 [Σ+]	2.00	Enter Y_2
Continue for remaining data points		
220 [X⇄Y]	253.00	Enter X_{12}
4775 [Σ+]	12.00	Enter Y_{12}
250 [X⇄Y]	221.00	Enter X_{13}
20830 [Σ+]	13.00	Enter Y_{13} (Last Data Point)
[2nd] [MEAN]	11689.62	Mean of Y
[÷] [INV] [2nd] [MEAN]	332.69	Mean of X
[2nd] [S. DEV.]	7314.83	Standard Deviation of Y
[÷] [INV] [2nd] [S. DEV.]	182.32	Standard Deviation of X
[2nd] [CORR]	0.60	Correlation Coefficient
[2nd] [SLOPE]	24.24	Slope of Regression Line
[2nd] [Intcp]	3626.21	Y-Intercept of Regression Line

C. Trend-Line Analysis

Using the data in Table 2, predict the homicide rate in Chaos City for 1978 and 1980. In what year is the homicide rate likely to reach 100?

PRESS	DISPLAY	COMMENT
2nd CA	0	
2nd FIX 4	0.0000	
1967 X⇄Y	0.0000	Enter First X_1 Value
12 Σ+	1.0000	Enter First Y_1 Value
13 Σ+	2.0000	Enter Y_2: Calculator Automatically Increases X Value by One for Each Value Entered
12 Σ+	3.0000	
14 Σ+	4.0000	
15 Σ+	5.0000	
18 Σ+	6.0000	
20 Σ+	7.0000	
25 Σ+	8.0000	
23 Σ+	9.0000	
25 Σ+	10.0000	
29 Σ+	11.0000	1977 Y_{10} Value
2nd CORR x2	.9298	Coefficient of Determination
1978 2nd y1	29.2545	Homicide Rate Estimate for 1978
1980 2nd y1	32.7636	Homicide Rate Estimate for 1980
100 2nd x1	2018.3212	2018 Estimated Year
2nd SLOPE	1.7545	Slope
2nd Intcp	-3441.2365	Y-Intercept

TABLE 2. MURDERS IN CHAOS CITY, 1964 - 1977

YEAR (X)	HOMICIDE RATE (Y)
1967	12
1968	13
1969	12
1970	14
1971	15
1972	18
1973	20
1974	25
1975	23
1976	25
1977	29

Source: Hypothetical Data

III. PROGRAMMING

A. Programming Keys

Develop a program to evaluate the regression equation:

$$Y = 1.7545 X - 3441$$

PRESS	DISPLAY	COMMENT
[2nd] [CA]	0	
[2nd] [FIX] 2	0.00	
[2nd] [LRN]	00 00	In Learn Mode
[X] 1.7545	07 00	
[=] 3441 [=]	13 00	
[2nd] [R/S] [2nd] [RST]	15 00	
[2nd] [LRN]	0	End of Program
[2nd] [RST]	0.00	Reset to 0
1980 [2nd] [R/S]	32.91	Homicide Rate Estimates for the Period 1980-1985
1981 [2nd] [R/S]	34.66	
1982 [2nd] [R/S]	36.42	
1983 [2nd] [R/S]	38.17	
1984 [2nd] [R/S]	39.93	
1985 [2nd] [R/S]	41.68	

MODULE 6
DATA INTERPRETATION -- SYSTEM

The purpose of Module 6 is to introduce system analysis and 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

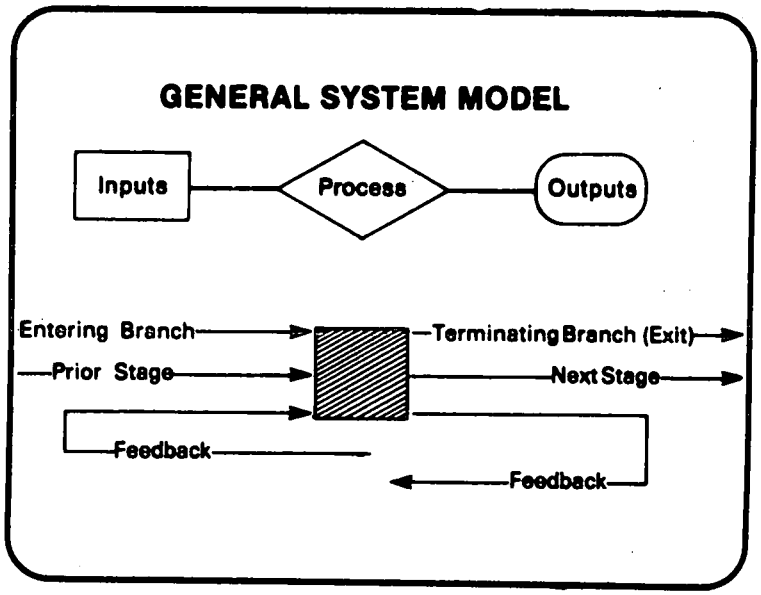
I. INTRODUCTION

A. What is a System?

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

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

V.A. (6-1):



B. What is the Criminal Justice System?

+ 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.

+ 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.

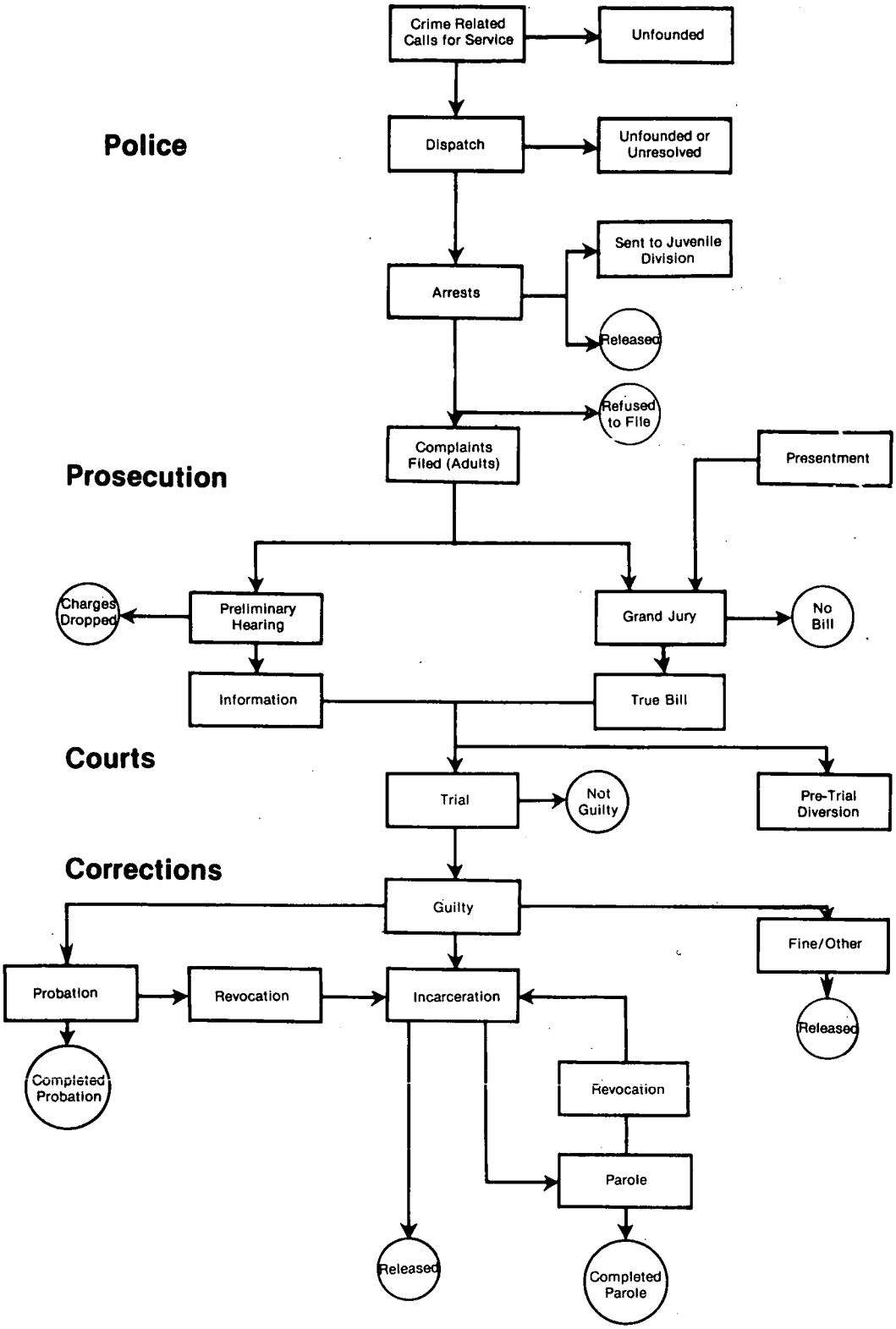
+ In systems terms, the elements of the criminal justice system are the offender and other individuals who have been arrested for the commission of criminal acts, criminal justice agencies and their personnel, equipment and facilities.

  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.

+ The components of the criminal justice system are interdependent.

+ One way of viewing the criminal justice system, emphasizing its components, is presented in Exhibit 1.

Exhibit 1. The Criminal Justice System



C. How can the Criminal Justice System be Analyzed?

+ Flow charts.

+ Input/Output analysis.

+ System analysis techniques using the tools taught in Modules 3, 4, and 5.

II. FLOW CHARTS

A. Uses of Flow Charts.

+ Aid to Reader or Audience.

+ It clarifies thinking.

- Identify gaps in knowledge.

- Tighten logic.

B. Types of Flow Charts.

+ Process flow chart.

- Physical flow of offenders from one component to another is shown.

- Exhibit 1 provided an example.

+ Operations charts.

- Shows essential operational aspects of the system.

- Exhibit 2 provides an example.

- Note that:

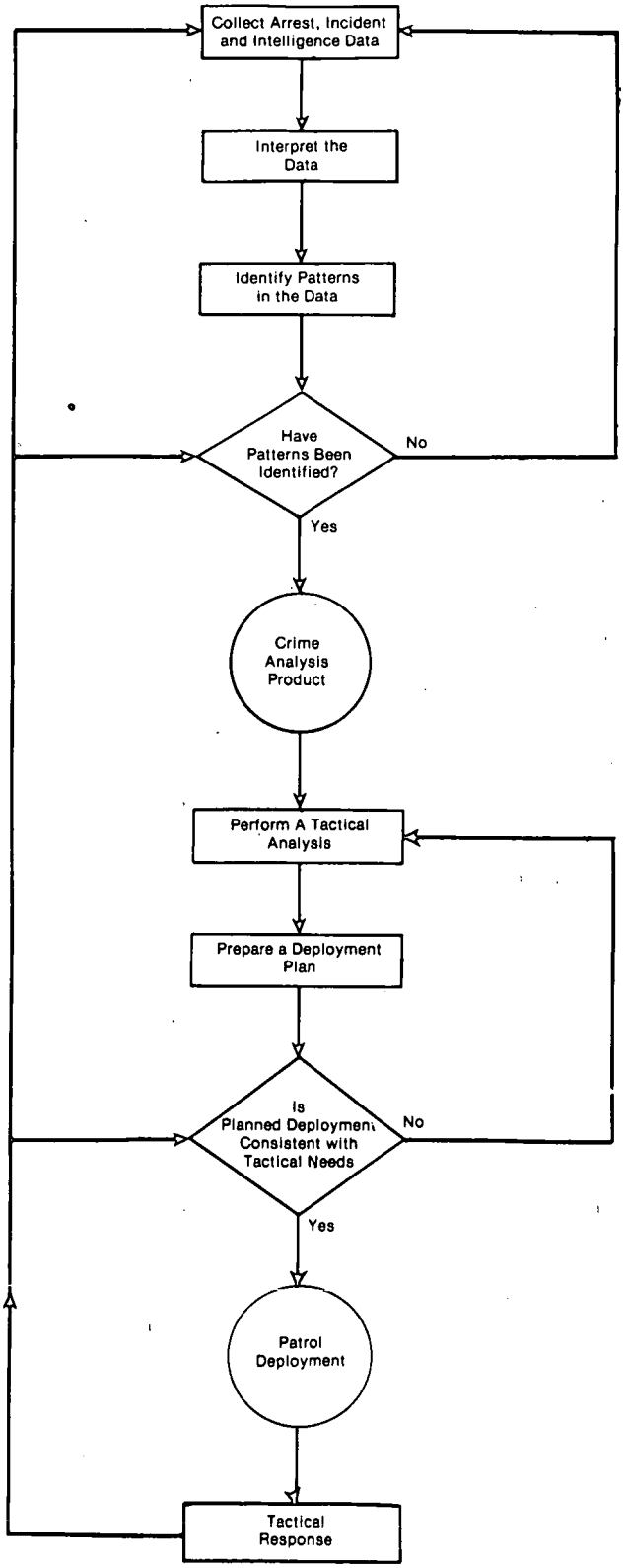
A rectangle should be used to present an instruction or information.

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.

+ Dependency Chains.

  - Portrays a sequence of events.

  - Dependence of various events and not flows is emphasized.

  - Examples of a dependency chain are PERT Charts.

+ Organizational Patterns.

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

  - Shows relationships and flows of authority and responsibility in an organization.

  - Generally, solid lines are used to indicate authority and responsibility. Dotted lines are used to indicate "confer and advise."

+ Convergence/divergence flow charts.

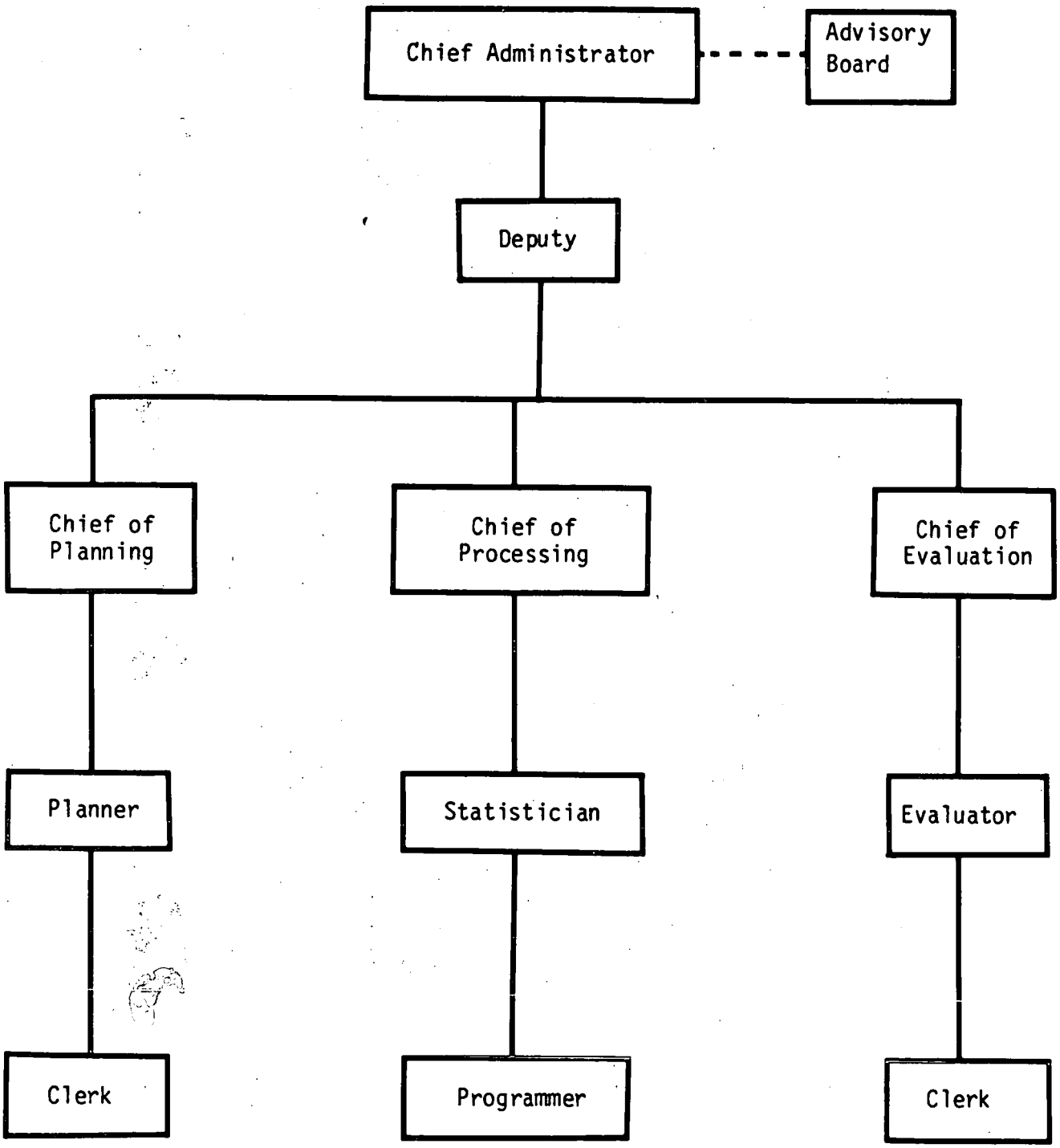
  - A statistical flow of offenders may diverge or converge leading to one or several outcomes. This is the principle of a disposition tree.

  - Disposition trees are a type of widely used flow chart in criminal justice.

  - See Exhibit 4 for an example of a disposition tree.

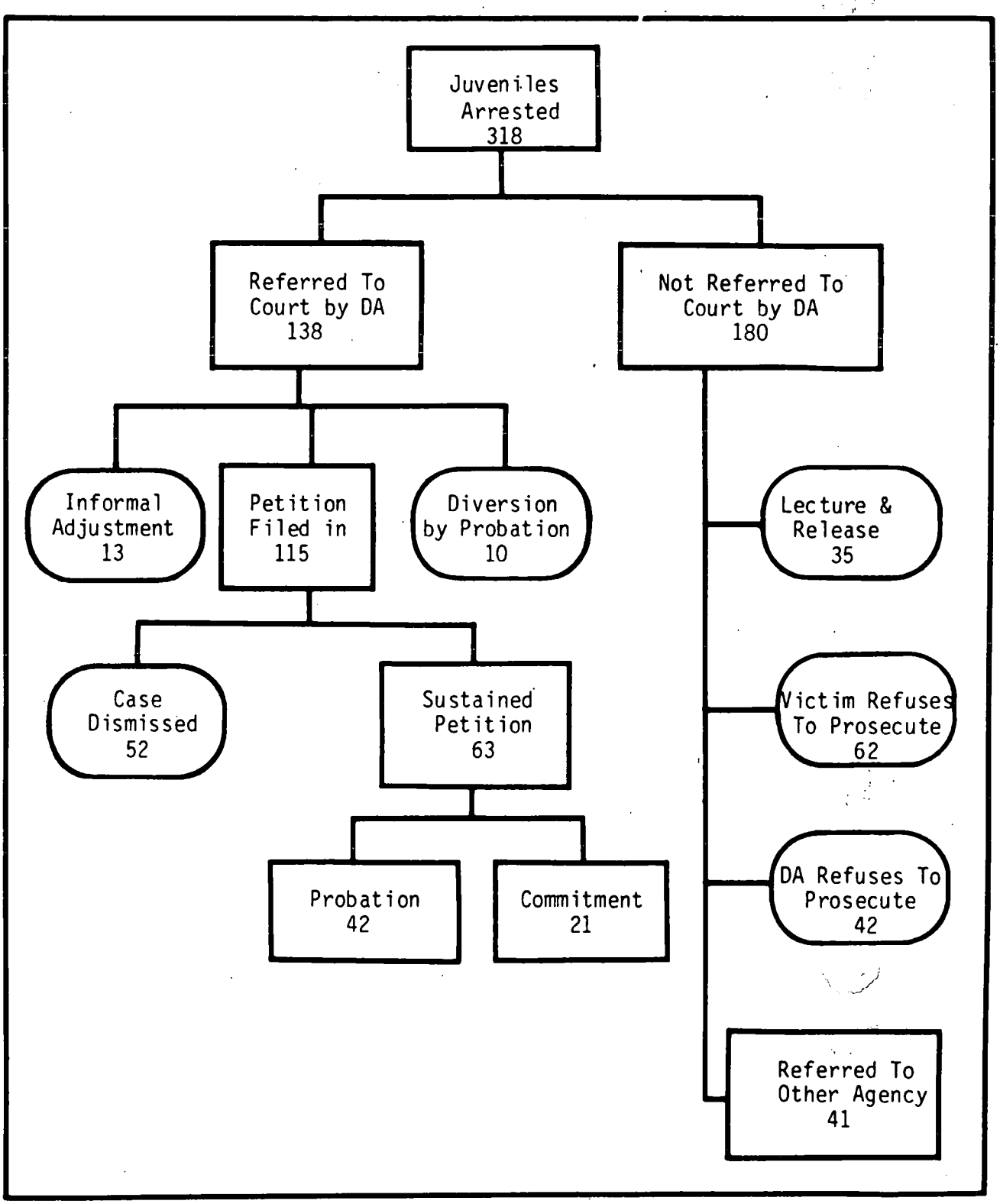
  - The use and interpretation of various types of disposition trees is covered in the next section.

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.

FLOW CHARTS

PURPOSE

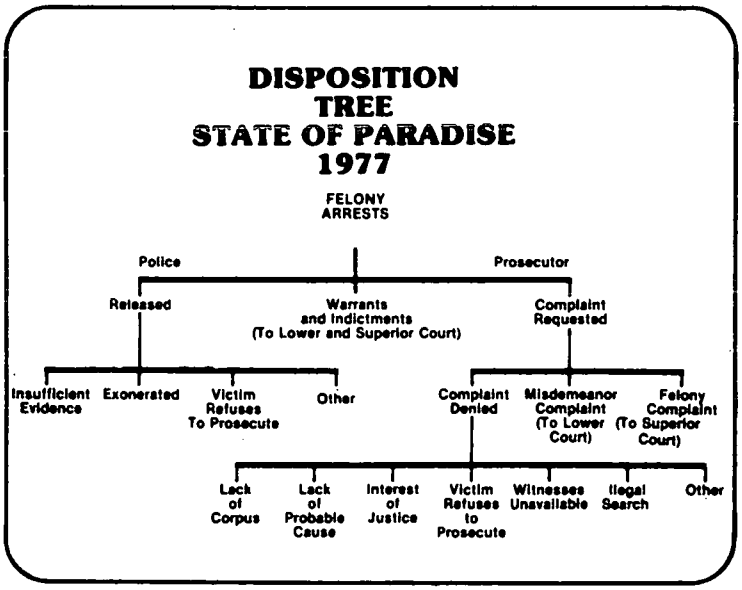
To illustrate the construction, uses, and interpretation of flow charts with related summary tabulations of offender flows.

WALK-THROUGH 'K'

DATA SET/WORKSHEET

A. Disposition Tree

V.A. (6-2):

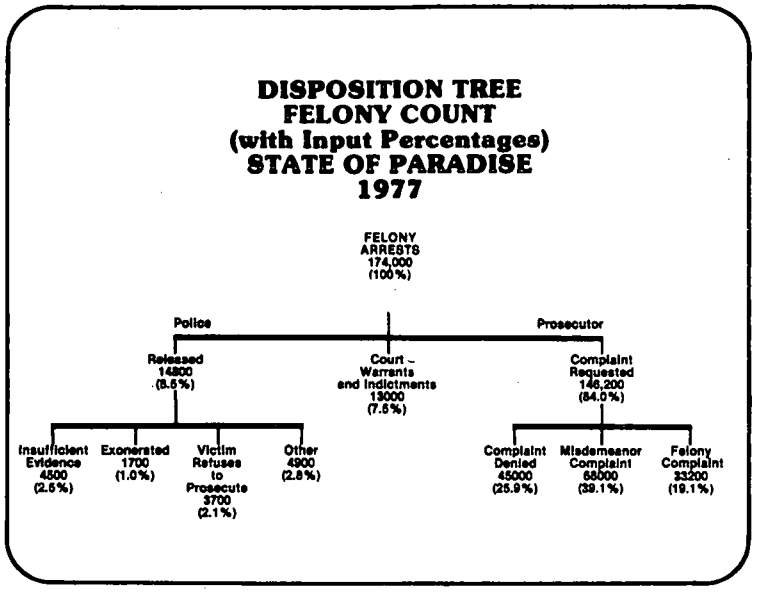


WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

B. Disposition tree with input percentages.

V.A. (6-3):



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

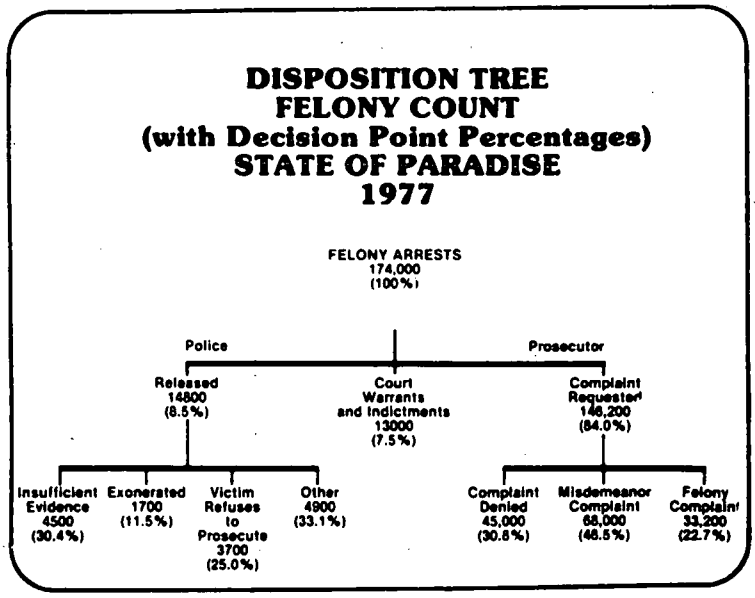
r = .66

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

C. Disposition tree with decision points.

V.A. (6-4)



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

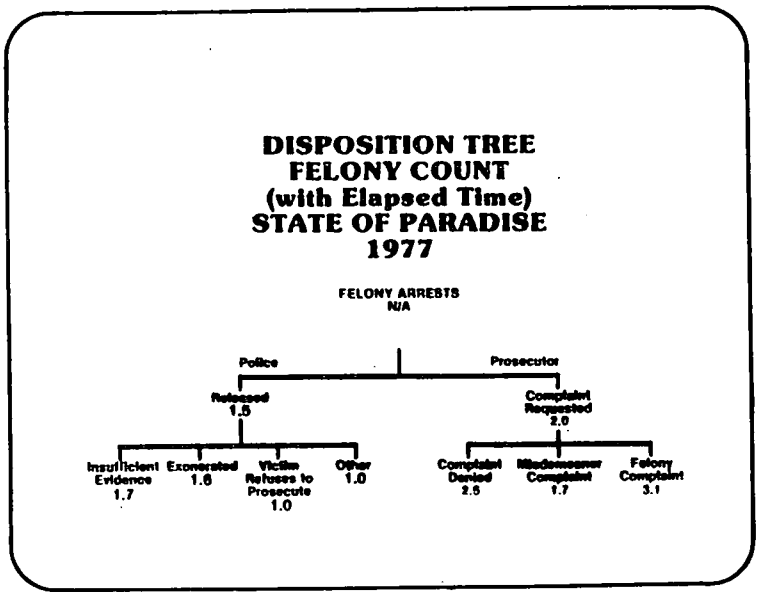
Source: Chaos County, 1977.

WALK-THROUGH 'K'

DATA SET/WORKSHEET (Continued)

D. Disposition tree with elapsed times.

V.A. (6-5):



E. Limits and uses of transaction data and summary tabulations.

WALK-THROUGH 'K'

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

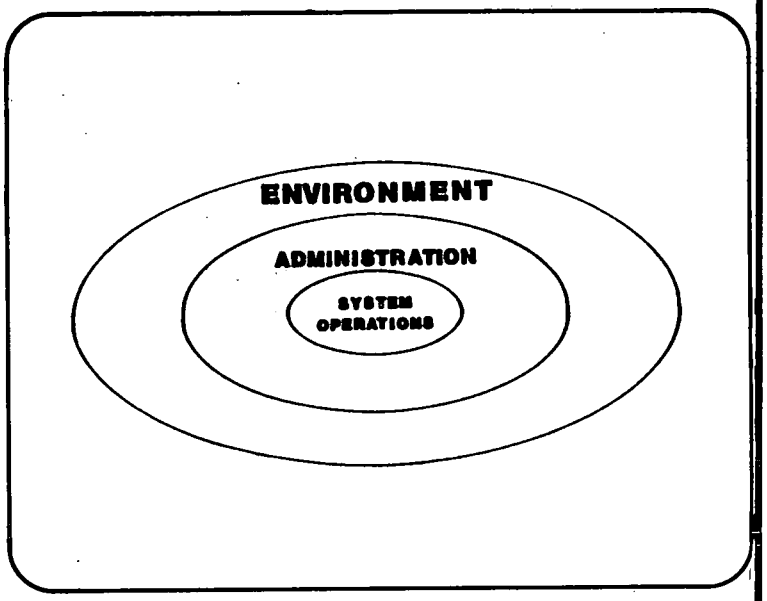
* Can not be used to identify the impact of system changes.
* Can not be used to elaborate the process or "dynamic" aspects of the criminal justice system.

III. SYSTEM CONCEPTS

A. Overview of System Concepts.

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

V.A. (6-6):



B. Environment.

C. Administration.

D. Systems Operations.

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	

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.

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

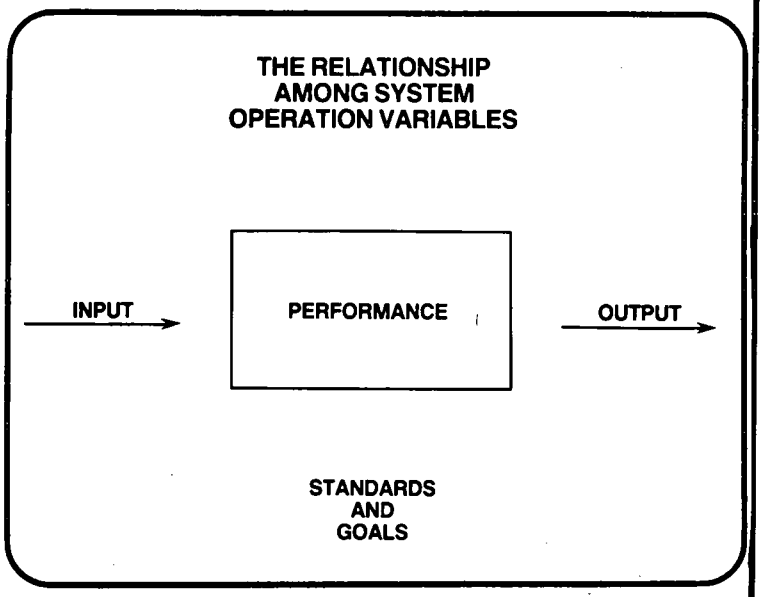
E. System Operations Variables and Measures

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

  - Standards
  - Goals
  - Input
  - Performance
  - Output

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

V.A. (6-7)



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

V.A. (6-8):

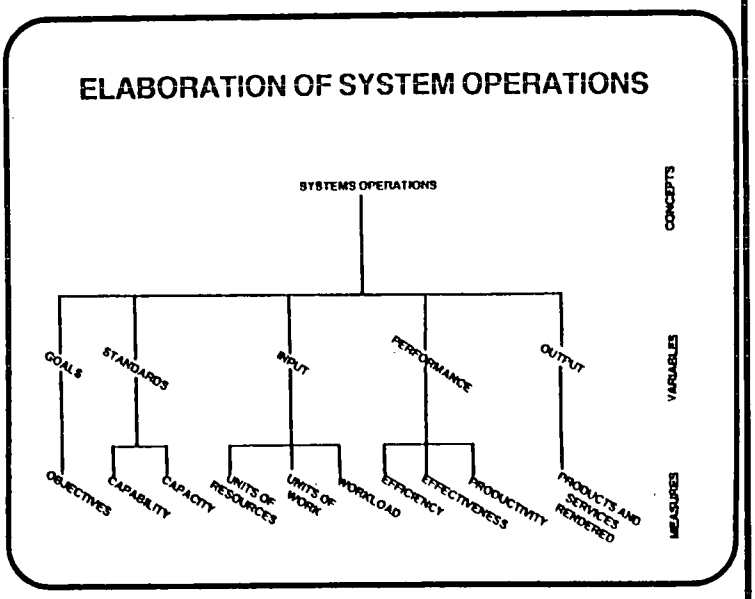


Exhibit 8. Standards

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:

The 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.

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.

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

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.

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?

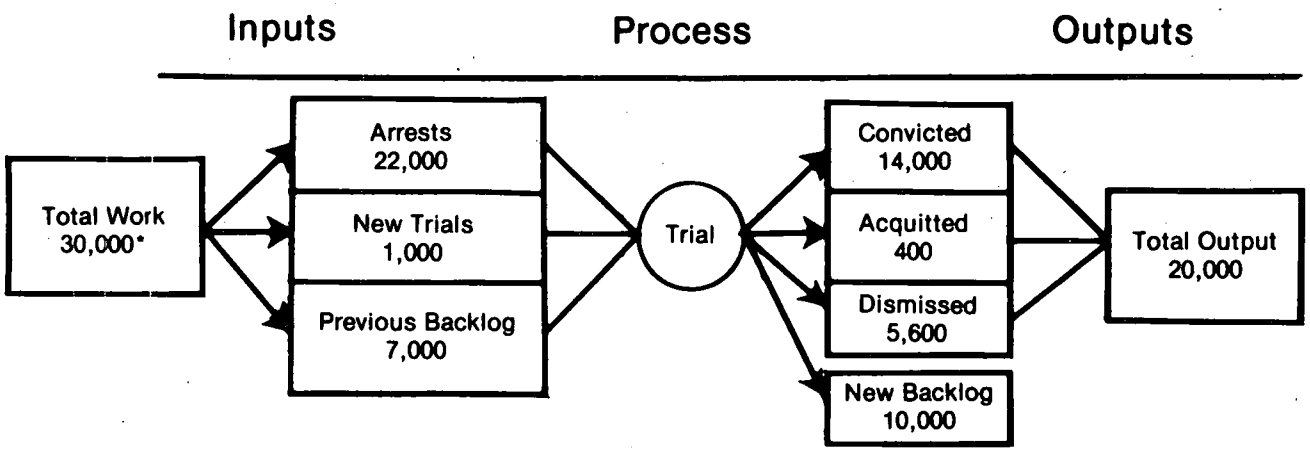
E. Output: What has been done?

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.

WALK-THROUGH 'L'

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)

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

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:

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

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

$$E_f = 42.8\%$$

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.

   $C_1 = R \times P^s$ = 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.

   $C_2 = R \div P^s$ = $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.

   $C_3 = R \div P^s$ = 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.

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

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.

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

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

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 Minutes/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.)

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

WALK-THROUGH 'L'

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) =

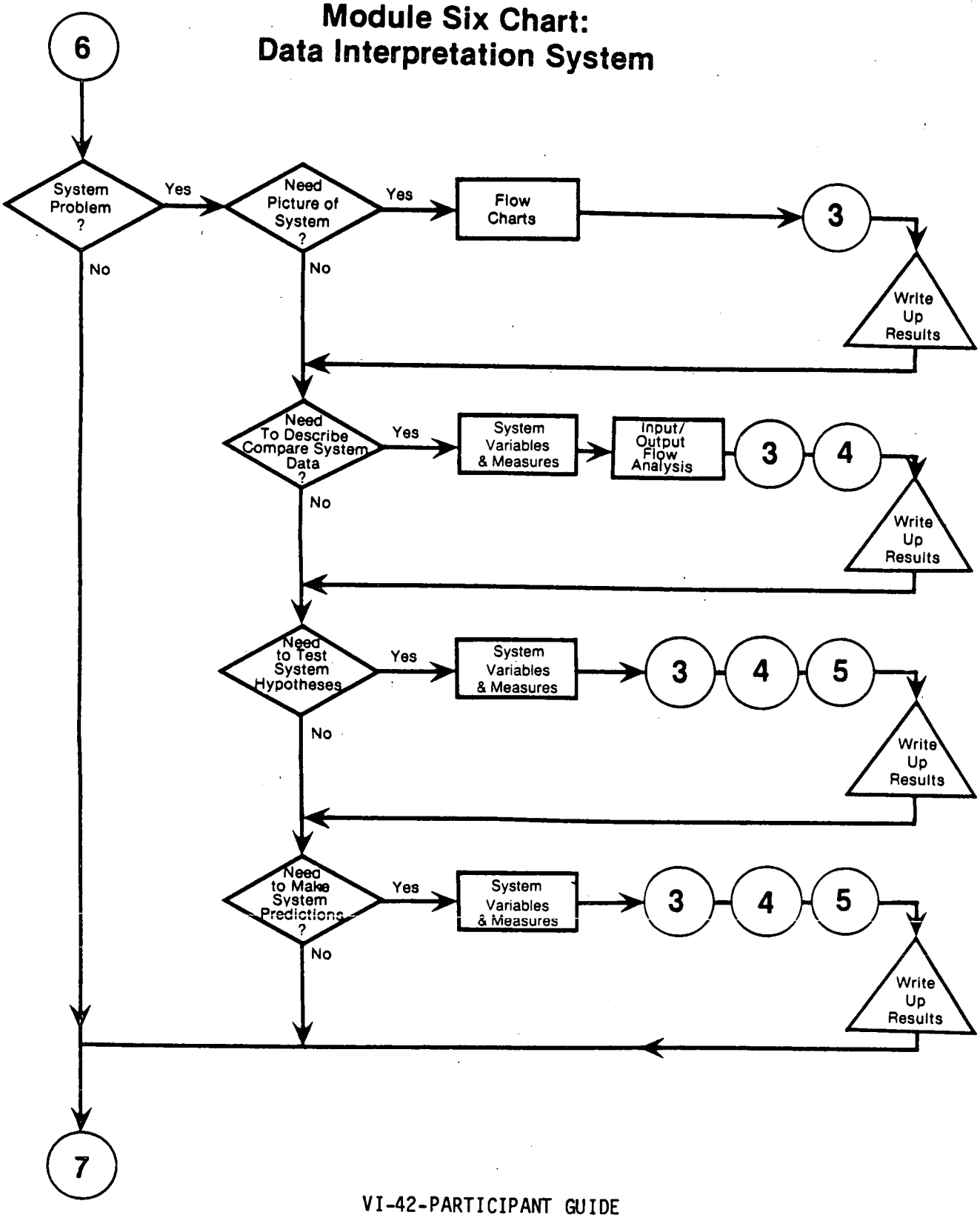
$$30{,}000 \text{ Cases} - \frac{(17 \text{ Judges} \times 96{,}000 \text{ Judge-Minutes/Year})}{72 \text{ Judge-Minutes/Case}} = 7{,}333 \text{ Cases}$$

WALK-THROUGH 'L'

V. CONCLUSION

V.A. (6-9):

Module Six Chart: Data Interpretation System



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.

NOTES

I. CONSIDERATIONS IN PREPARING PRESENTATIONS

A. Preparation.

+ When presentations are not properly prepared, essential facts and messages are either destroyed or lost.

B. Responsibilities.

+ Analyst or presenter must be certain the information is transmitted clearly and succinctly.

C. Cautions.

+ Because of brief audience interest span, if a presentation is rambling or confusing most of the audience will "turn off."

+ With rare exceptions most of the problems that fall on the analyst's desk are not purely "criminal justice" in nature.

D. Presentation Objectives.

+ Develop in your problem statement a sense of the "larger picture."

+ The problem or issue should be separated into two essential parts.

+ Efforts need to be expended to overcome the major barriers to effective presentations.

+ "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.

E. Technical Checklist.

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?

II. ACHIEVING PERSPECTIVE

A. Role of Elected Politicians.

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

B. Role Behavior of Private Citizens.

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)

C. Role Behavior of Administrators.

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.

NOTES

D. Role of Analyst.

V.A.(7-5):

OPTIMAL ROLE BEHAVIOR OF ANALYST

- Objective
- Realistic
- Flexible
- Sensitive
  - — Politics
  - — Emotional Issues
- Future Oriented

NOTES

III. GUIDELINES FOR EFFECTIVE PRESENTATIONS

A. Uses.

B. Guidelines.

V.A. (7-6):

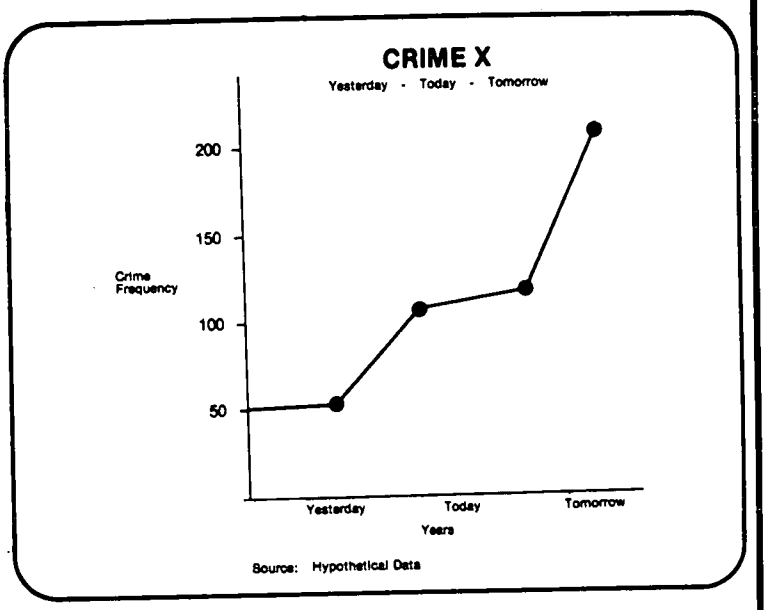
PRESENTATION GUIDELINES

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

C. Clarification and Interpretation.

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

V.A. (7-7):



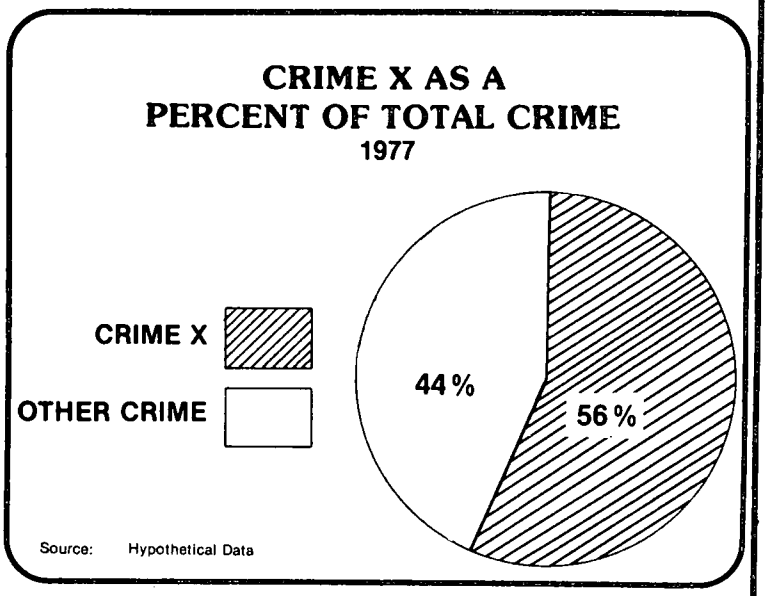
NOTES

D. Use Contrasts and Comparisons.

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

E. Use Illustrations and Examples.

V.A. (7-8):



F. Anticipate Questions and Issues.

V.A. (7-9):

ANTICIPATE QUESTIONS AND ISSUES

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

G. Use Terms Important to the Audience.

+ While the technical language is helpful if the group can use it, it is not helpful if there are no technically trained people.

NOTES

IV. PREPARING A WRITTEN REPORT

A. Content

+ Avoid major omissions.
+ Logical organization is vital.
+ Consistency of form, as well as content, is essential.
+ Writing must be clear and to the point.
+ Report should highlight the priority message(s).

B. Guides for use of quantitative data and statistics in written reports:

+ Purpose of data in a report must be clearly understood by the writer and the reader.
+ Data should be integrated into the narrative.
+ Selection of data should be made on the basis of its relevancy, clarity, validity, reliability, and assistance to the reader in understanding the problem.

C. Written Report Organization.

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**

NOTES

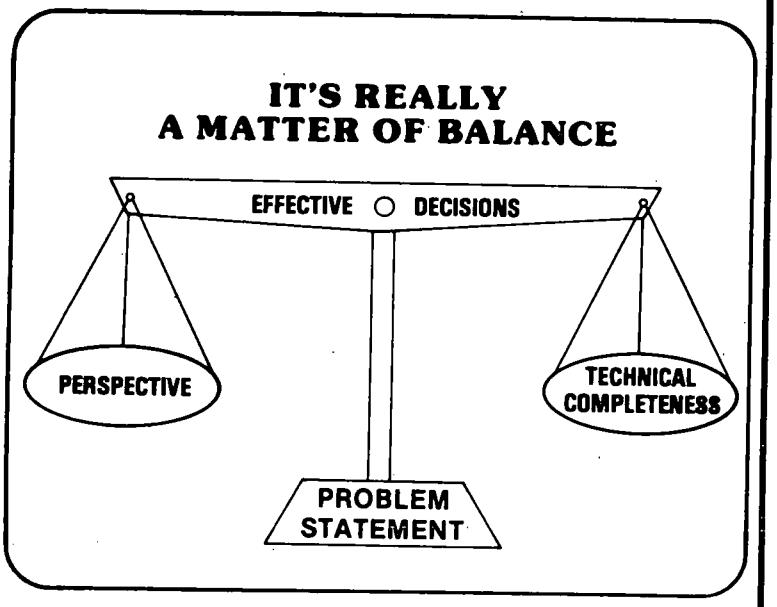
V. CONDUCTING A BRIEFING

A. Briefing Materials.

B. Manner of Presentation.

C. Provide a balanced presentation.

V.A. (7-11):



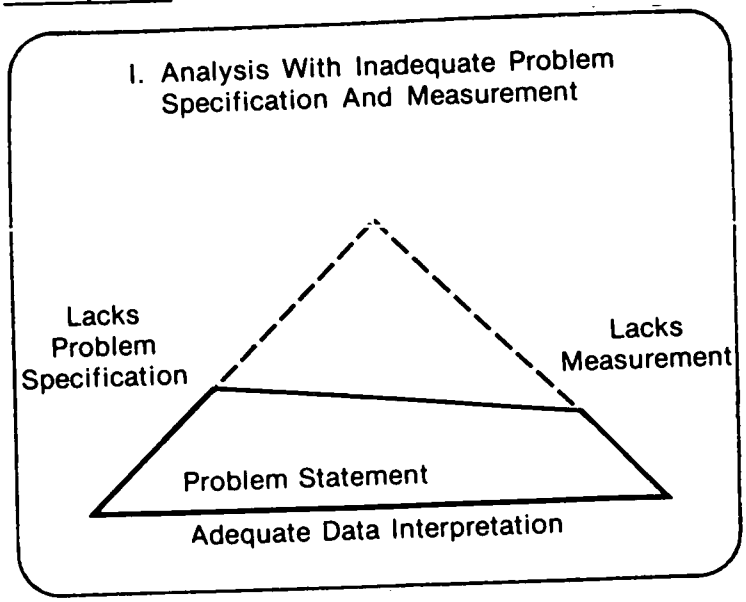
NOTES

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.

+ Analysis with Inadequate Problem Specification and Measurement.

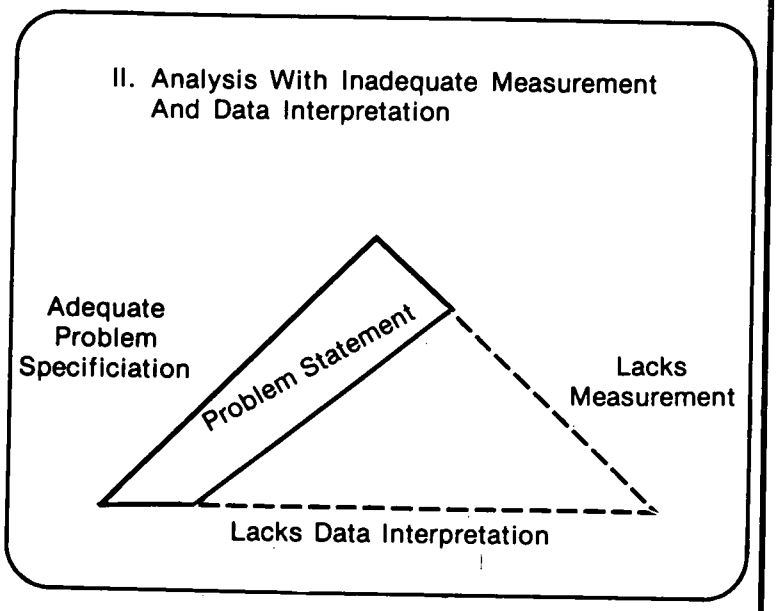
V.A. (7-12):



NOTES

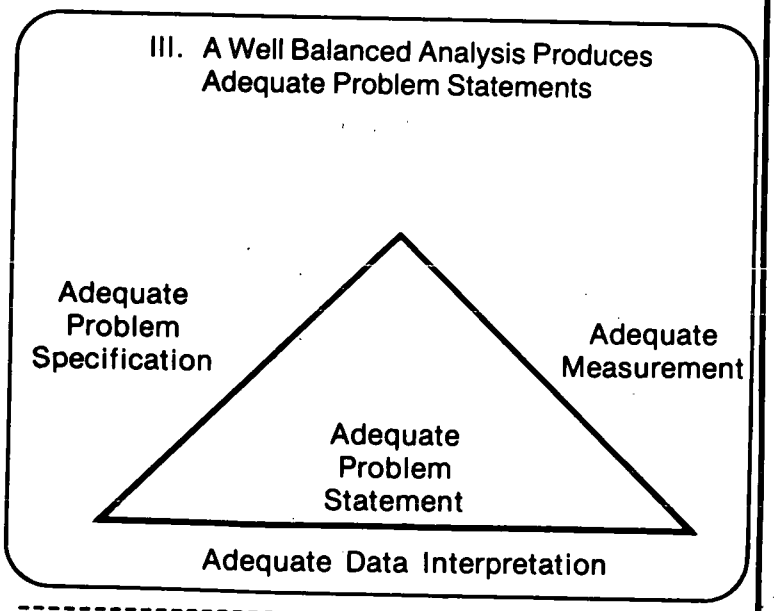
+ Analysis with Inadequate Measurement and Data Interpretation.

V.A. (7-13):



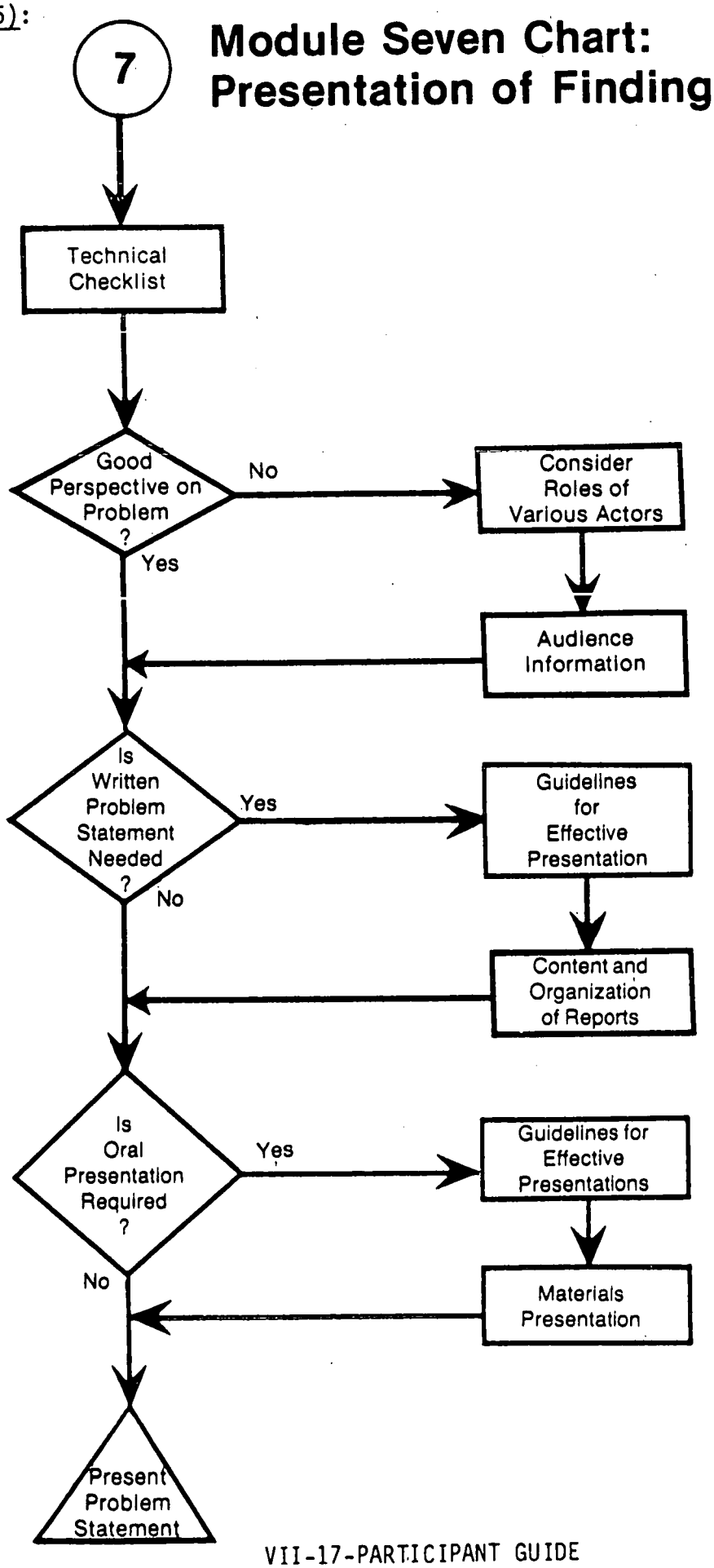
+ A Well Balanced Analysis Process Results in an Adequate Problem Statement.

V.A. (7-14):



V.A. (7-15):

Module Seven Chart: Presentation of Findings



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

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.

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	5-7
#2	Assess Hypotheses	Monday p.m.	120 min.	Worksheets	8-12
Debriefing	Review Tasks #1 and #2	Tuesday p.m.	60 min.	Worksheets	13
#3	Data Interpretation	Thursday p.m.	120 min.	Worksheets	14-17
#4	Preparing Portfolio	Thursday p.m.	130 min.	Problem Statement Outline	18-23
Submit	Problem Statement Outline	Thursday p.m.		Problem Statement Outline	18-23
#5	Preparing Briefing	Friday a.m.	60 min.	Briefing Materials	24-26
#6	Presentations	Friday a.m./p.m.	180 min.	Formal Presentations	24-26

STAFF REPORTS	Page
Group A - Crime Prevention	28-30
Group B - Attrition Rate of Cases	31-33
Group C - Criminal Recidivism Among Adult Offenders	34-35

DATA SETS	Page
Group A - Crime Prevention	37-50
Group B - Attrition Rate of Cases	51-54
Group C - Criminal Recidivism Among Adult Offenders	55-60

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

MAJOR EXERCISE

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

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?

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

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.

MAJOR EXERCISE

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.

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

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

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

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

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:

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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.

MAJOR EXERCISE

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: 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

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GROUP B - Attrition Rate of Cases	31-33
GROUP C - Criminal Recidivism Among Adult Offenders	34-35

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: 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.

MAJOR EXERCISE

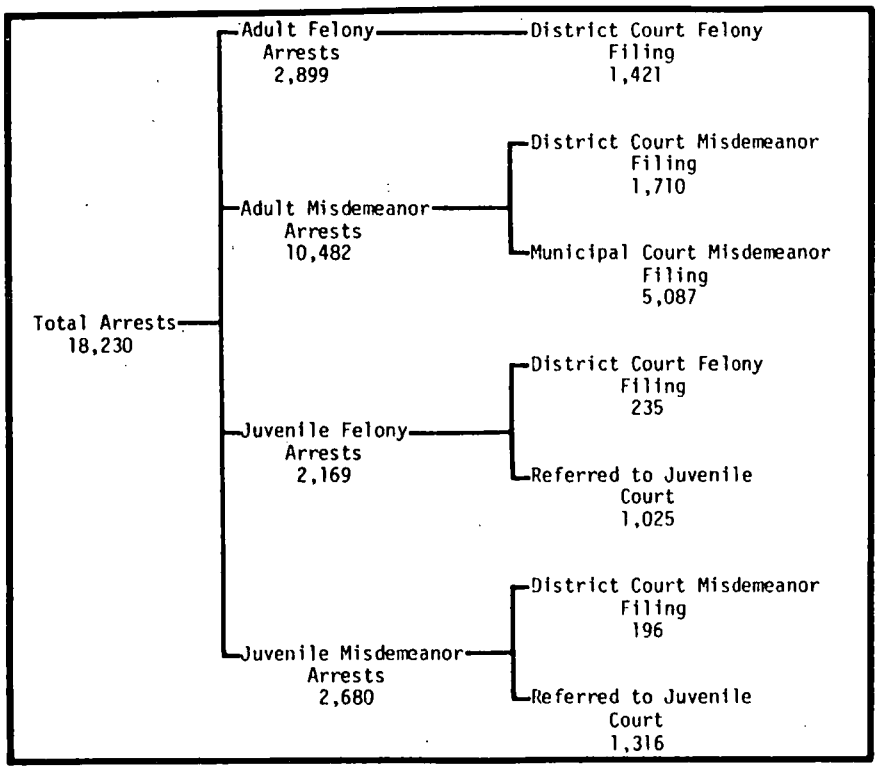
MAJOR EXERCISE: CHAOS CITY
(GROUP B)

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

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

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%

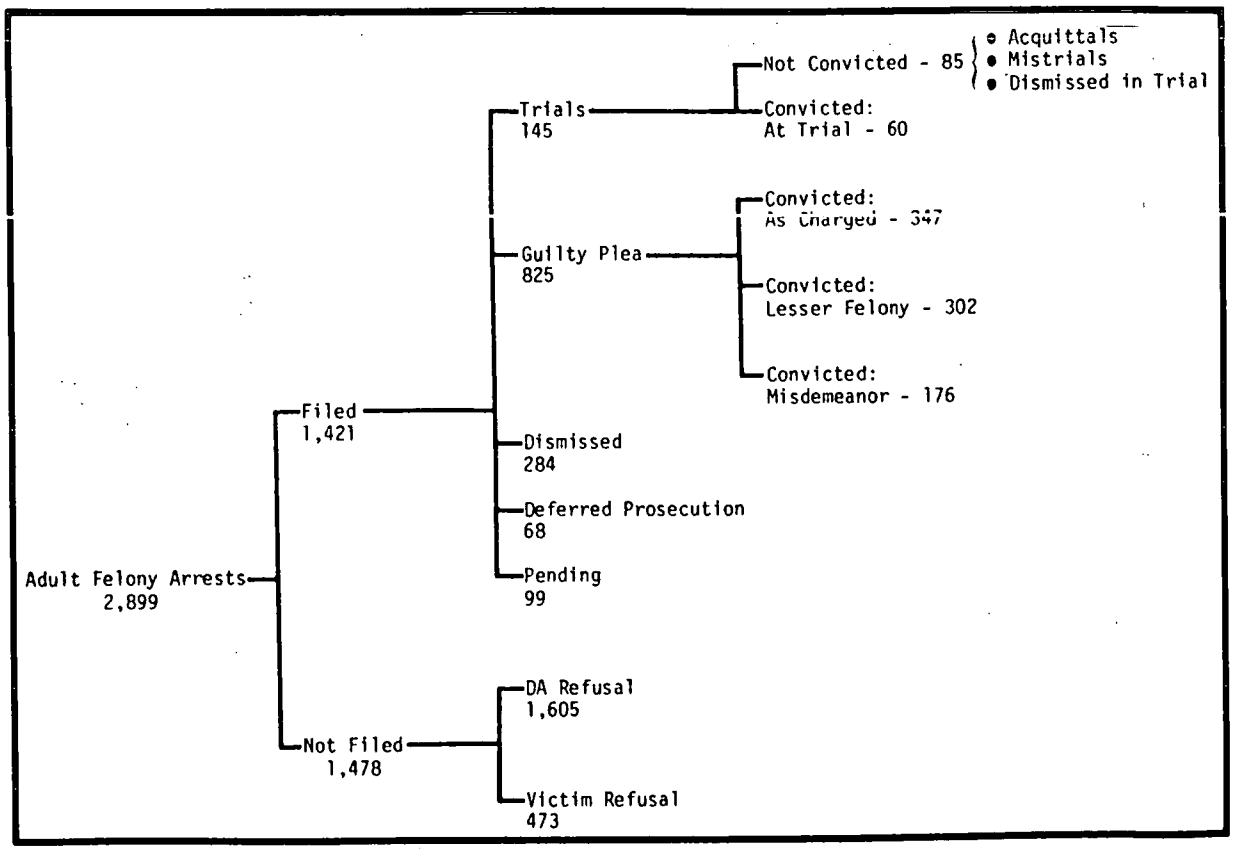
Source: Chaos City District Attorney's Office, 1978.

MAJOR EXERCISE

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

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.)

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
DATA SET

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GROUP B	TABLES B-1 to B-5	51-54
GROUP C	TABLES C-1 to C-4	55-60

MAJOR EXERCISE

(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.

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%

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)

MAJOR EXERCISE

Table A-7. 1977 Commercial Burglary Characteristics

MONTH OF OCCURRENCE	#	%
January	65	7.2
February	74	8.2
March	61	6.8
April	82	9.1
May	73	8.1
June	89	10.0
July	91	10.1
August	73	8.1
September	66	7.3
October	81	9.0
November	74	8.2
December	71	7.9
TIME OF DAY	**#**	**%**
Day (6am-6pm)	76	8.5
Night (6pm-6am)	652	72.4
Unknown	172	19.1
PLACE OF ENTRY	**#**	**%**
Front	361	40.1
Side	256	28.4
Back	247	27.4
Other/Unknown	36	4.0
TYPE OF ENTRY	**#**	**%**
Force	760	84.5
No Force	140	15.5
TYPE OF TARGET	**#**	**%**
Gas Station	61	6.8
Drug Store	10	1.1
School	34	3.8
Grocery Store	27	3.0
Hotel/Motel	31	3.4
Department Store	5	.6
Bar/Restaurant	33	3.7
Factory	36	4.0
Office Building	220	24.5
Other	443	49.2

Table A-7. - Continued

PLACE AND METHOD OF ENTRY BY TYPE OF TARGET

TYPE OF TARGET	PLACE OF ENTRY				TYPE OF ENTRY	
	Front	Side	Back	Other/Unk.	Force	No Force
Gas Station (n=61)	27	22	9	3	60	1
Drug Store (n=10)	4	2	3	1	10	-
School (n=34)	7	22	4	1	27	7
Grocery Store (n=27)	14	5	5	3	25	2
Hotel/Motel (n=31)	27	1	2	1	4	27
Department Store (n=5)	3	1	1	-	5	-
Bar/Restaurant (n=33)	13	2	18	-	30	3
Factory (n=36)	7	16	12	1	27	9
Office Building (n=220)	79	63	75	3	168	52

Source: See Table A-6. (Based on a sample of 900 police reports)

Table A-8. Street Robbery, 1977

TYPE	#	%
Personal	502	84
Purse-snatch	73	12
Business	25	4
MONTH OF OCCURRENCE	**#**	**%**
January	41	7
February	49	8
March	40	7
April	60	10
May	47	8
June	58	10
July	42	7
August	57	9
September	62	10
October	40	7
November	55	9
December	49	8
TIME OF DAY	**#**	**%**
Midnight-9am	95	16
9am-3pm	132	22
3pm-Midnight	373	62
LOCATION	**#**	**%**
Street	443	74
Parking Area	55	9
Alley	49	8
Other	53	9
VICTIM SEX	**#**	**%**
Male	263	44
Female	337	56
VICTIM AGE	**#**	**%**
Juvenile (-18)	91	15
Young Adult (18-29)	127	21
Older Adult (30-64)	238	40
Elderly (65+)	144	24

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)

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

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

MAJOR EXERCISE: CHAOS CITY
(GROUP B)

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

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	----
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.

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)