

FORENSIC EVIDENCE AND THE POLICE:
The Effects of Scientific Evidence
on Criminal Investigations
TECHNICAL APPENDICES

by

Joseph L. Peterson

Steven Mihajlovic

Michael Gilliland

Final Report

July 1983

TABLE OF CONTENTS

Table of Contents	ii
List of Figures and Tables	iii
Preface	vi
Appendix A Background Information Methodology Supplement	
Codebook	1
A-1 Background Information	1
A-2 Methodology Supplement	7
A-3 Codebooks	21
Appendix B Investigative Practices Associated with Follow-up Arrests	43
Appendix C Chi Squares Values for Tables in Chapter VI	89
Appendix D Log Linear Analysis	99

FIGURES AND TABLES

Table A-1	Background Information on Study Sites	1
Figure B-1	Physical Evidence Cases in the Study Sample by Arrest Outcome	45
Figure B-2	Arrest Status and Outcome of Physical Evidence Cases in All Jurisdictions	46
Table B-1	Information Factors Leading to Follow-up Arrests in the Crime of Homicide	48
Table B-2	Information Factors Leading to Follow-up Arrests in the Crime of Sexual Assault	49
Table B-3	Information Factors Leading to Follow-up Arrests in the Crime of Robbery	50
Table B-4	Information Factors Leading to Follow-up Arrests in the Crime of Assault/Battery	51
Table B-5	Information Factors Leading to Follow-up Arrests in the Crime of Burglary/Property	52
Table B-6	Information Factors Leading to Follow-up Arrests in All Crimes	55
Table B-7	Investigation Factors/Information Sources	56
Table B-8	Percent of Cases with Suspects Where Suspect is Searched and Evidence Submitted to Laboratory . . .	64
Table B-9	Rates of Follow-up Arrests in the Crime Categories of Robbery, Assault and Burglary For Cases with and without Physical Evidence Collected	66
Table B-10	Peoria Correlations: Homicides, Sexual Assaults, Robberies, Assaults/Batteries, Burglaries	69
Table B-11	Chicago Correlations: Homicides, Sexual Assaults, Robberies, Assaults/Batteries, Burglaries	74
Table B-12	Kansas City Correlations: Homicides, Sexual Assaults, Robberies, Assaults/Batteries, Burglaries	79
Table B-13	Oakland Correlations: Homicides, Sexual Assaults, Robberies, Assaults/Batteries, Burglaries	84
Table C-2	Clearance Rates for Evidence and No-Evidence Cases	89

FIGURES AND TABLES (continued)

Table C-3	Police Knowledge of Suspects at Outset of Investigation	90
Table C-4	Time Elapsed From Discovery of Crime to Report to Police/Police Response	91
Table C-5	Witness Information Provided to Police at Outset of Investigation	92
Table C-6	Clearance Rates Controlling for Police Knowledge of Suspects at Outset of Investigation	93
Table C-7	Clearance Rates Controlling for Time Elapsed from Crime Discovery to Report to/Response by the Police	94
Table C-8	Clearance Rates Controlling for Witness Information Provided to Police at Outset of Investigation	95
Table C-9	Percent of Arrests Leading to Formal Charges Being Filed for Evidence and No-Evidence Cases	96
Table C-10	Percent of Arrests Leading to Convictions for Evidence and No-Evidence Cases	97
Table C-11	Percent of Incidents Resulting in at Least one Conviction	98
Table D-1	Empirical Odds for Clearance - Robbery	101
Table D-2	Empirical Odds for Clearance - Assault	102
Table D-3	Empirical Odds for Clearance - Burglary	103
Table D-4	Empirical Odds for Clearance Across All Offenses	104
Table D-5	Empirical Odds for Clearance Across All Jurisdictions	105
Table D-6	Differences in Likelihood Chi-Squares (CETWOJ): Conditional Independence Test	107
Table D-7	Differences in Likelihood Chi-Squares (CETWOJ): Additive/Complicated Models	108
Table D-8	Empirical Odds for Conviction in DERTWOJ	113
Table D-9	Empirical Odds for Conviction in DEROJ	114
Table D-10	Empirical Odds for Conviction in DEROJ	115

FIGURES AND TABLES (continued)

Table D-11	Differences in Likelihood Chi-Squares (DEROJ): Conditional Independence Test	116
Table D-12	Differences in Likelihood Chi-Squares (DEROJ): Additive/Complicated Models	116
Table D-13	Differences in Likelihood Chi-Squares (DETOJ): Conditional Independence Test	118
Table D-14	Differences in Likelihood Chi-Squares (DETOJ): Additive/Complicated Models	118

PREFACE

These technical appendices to the final report, Forensic Evidence and the Police: The Effects of Scientific Evidence on Criminal Investigations, provide supplemental documentation for the results presented in the main report. The technical appendices are organized in the following manner:

Appendix A

Appendix A-1 includes additional background information about each of the host police departments and crime laboratories. Appendix A-2 is a supplement to the methodology discussion included in the final report and provides greater detail on the data collection approach, case sampling and file searching procedures used in the study. Appendix A-3 contains the two primary data collection instruments used in the study.

Appendix B

Appendix B presents a discussion of investigative practices employed by the police in the four study sites which lead to follow-up arrests -- arrests occurring more than 10 minutes after the crime was reported to the police/or 10 minutes after the arrival of the first officer at the scene.

Appendix C

Appendix C presents the Chi Square values and significance levels for the tables in Chapter VI of the final report.

Appendix D

Appendix D is a technical treatment of the log-linear analyses which are discussed in Chapter VII of the final report. The raw empirical odds used in these analyses are presented in tabular form in this appendix.

APPENDIX A

TABLE A-1
BACKGROUND INFORMATION ON STUDY SITES *

ATTRIBUTE	JURISDICTION			
	Peoria/Morton	Chicago	Kansas City	Oakland
Population	125,639	3,060,801	462,914	344,686
Crime Index Total	12,054	186,728	42,065	41,269
Index Crime Per Capita (1,000's)	95.9	61.0	90.9	119.7
Land Area (Square Miles)	38	228	317	59
Laboratory Established	1972	1930	1973	1944
Parent Law Enforcement Agency	Peoria Police Department (crime scene unit) Illinois Department of Law Enforcement (crime laboratory)	Chicago Police Department	Kansas City Police Department	Oakland Police Department
Sworn Personnel	218 (Peoria P.D.)	12,392	1,183	602
Index Crimes Per Sworn Officer	55:1	15:1	36:1	69:1

*Unless otherwise indicated, the information in this table describes the characteristics of the agencies and laboratories as they were in 1979.

TABLE A-1 (continued)
BACKGROUND INFORMATION ON STUDY SITES

ATTRIBUTE	JURISDICTION			
	Peoria/Morton	Chicago	Kansas City	Oakland
Criminal Investigators	35 (Peoria P.D.)	1,268	204	126
Organizational Placement of Crime Laboratory	Bureau of Scientific Services	Bureau of Technical Services	Bureau of Criminal Investigations	Bureau of Investigations
Scope of Service	Regional	Municipal	Regional	Municipal
Crime Laboratory Caseload (1979)	2,697	25,600	10,926	5,364
Ratio Cases to Examiner	300:1	512:1	840:1	766:1
Number of Scientific Staff	9(1)**	50	13(10)**	7(5)**
Ratio of Sworn Staff to (Proportionate) Scientific Staff	24:1(218:1)	248:1	91:1(118:1)	86:1(120:1)

**The number in parentheses refers to the proportionate number of scientific staff in the Morton and Kansas City regional laboratories examining cases from the Peoria and Kansas City jurisdictions. Approximately 10% of the Morton Regional Laboratory caseload is from Peoria and 80% of the Kansas City Regional Laboratory caseload is from Kansas City. This translates into 10% x 9 or 1 staff member in the Morton laboratory working Peoria cases and 80% x 13 or 10 staff members in the Kansas City laboratory working Kansas City Police Department cases. The Oakland Crime Laboratory staff of 7 includes 2 full-time fingerprint examiners; so to make the Oakland staffing level equivalent to the other laboratories, these 2 fingerprint examiners are excluded.

TABLE A-1 (continued)
BACKGROUND INFORMATION ON STUDY SITES

ATTRIBUTE	JURISDICTION			
	Peoria/Morton	Chicago	Kansas City	Oakland
Parent Police Department Budget	\$4,315,530	\$351,415,466	\$35,826,402	\$39,148,857
Crime Laboratory Budget (Excludes Crime Scene Search Function)	—	\$ 1,300,000 (approx.)	\$ 275,290	\$ 171,836
Ratio of Laboratory Budget to Parent Agency Budget	—	0.4%	0.8%	0.4%
Crime Scene Function: Organizational Unit	Peoria P.D. Admin. Services	Crime Laboratory	Criminalistics Division	Patrol Division
Number of Crime Scene Personnel	6	95	22	12
Index Crimes Per Technician	2,009	1,966	1,912	3,439
Ratio Sworn Staff to Technicians	36:1	130:1	54:1	50:1
Ratio of Crime Scene Technicians to (Proportionate) Laboratory Staff	.67:1(6:1)	1.9:1	1.7:(2.2:1)	1.7:1(2.4:1)

TABLE A-1 (continued)

BACKGROUND INFORMATION ON STUDY SITES

Physical Evidence Examination Capabilities	JURISDICTION			
	Peoria/Morton	Chicago	Kansas City	Oakland
Blood/Alcohol	0	0	X	0
Comp. Microscopy	X	X	X	X
Crime Scene Search	X	X	X	X
Drugs	X	X	X	X
Explosive	0	X	X	0
Fibers	X	X	X	X
Fingerprints	X	X	X	X
Flammables	X	X	X	X
Firearms	X	X	X	X
Glass	0	X	X	X
GSR	0	X	X	0
Hair	X	X	X	X
Paint	X	X	X	X
Polygraph	X	X	0	0
Questioned Doc.	0	X	0	0
Serial # Rest.	X	X	X	X
Serological	X	X	X	X
Soils/Minerals	0	X	X	0
Toolmarks	X	X	0	X
Toxicology	X	0	X	0
Trace	X	X	X	X
Voiceprints	0	0	0	0

X = Crime laboratory has examination capability

0 = Crime laboratory lacks examination capability

TABLE A-1 (continued)

BACKGROUND INFORMATION ON STUDY SITES

Reference Collections (Standard/open case file)	JURISDICTION			
	Peoria/Morton	Chicago	Kansas City	Oakland
Laundry/Dry Cleaning	No/No	No/No	No/No	No/No
Tire	No/No	No/No	No/No	No/No
Auto Paints	Yes/No	Yes/No	Yes/No	Yes/No
Hair	Yes/No	Yes/No	Yes/No	Yes/No
Fibers	Yes/No	Yes/No	Yes/No	Yes/No
Shoe Prints	No/No	Yes/Yes	Yes/No	No/No
Instrumental	Yes/No	Yes/Yes	Yes/No	Yes/No
Threatening Letters/ Bad Checks	No/No	Yes/Yes	No/No	No/No
Bullets/Cartridge Cases	Yes/Yes	Yes/Yes	Yes/Yes	Yes/Yes
Fingerprints	No/No	Yes/Yes	No/No	Yes/Yes
Wood	No/No	No/No	Yes/No	Yes/No
Blood	Yes/No	Yes/No	Yes/Yes	Yes/No

APPENDIX A-2

METHODOLOGY SUPPLEMENT

Appendix A-2 provides a more detailed discussion of the data collection approach, case sampling techniques, and file searching procedures used in the study. It is intended to supplement the summarized version which appears in Chapter I of the main report.

The empirical data which form the basis for this study were collected principally through a search of police, court and laboratory archives. For the most part, police case files constituted the primary source. These files included all the reports submitted by police personnel in the investigation of a suspected criminal offense: the initial report taken by the patrol officer, the detective's report(s), all follow-up supplemental reports, statements taken from witnesses and suspects, arrest reports, the crime scene report made by the evidence technician (detailing the evidence collected) and other miscellaneous documents.

The crime laboratory case folders were also reviewed for each case. These files generally contained an inventory sheet identifying the evidence being submitted, the examiner's work sheets and notes, photographs, the final laboratory report containing the results of the scientists examinations, and occasionally notes made by the scientist of conversations with investigative personnel.

In addition, prosecutor and/or court files were reviewed to ascertain the disposition of cases where suspects were arrested and booked.

These records provided the initial and final charges filed against each defendant, the manner in which the case was adjudicated (dismissal, guilty plea, trial), the final case outcome, and the sentence given the defendant.

Physical Evidence Data Collection Instrument

Two data collection instruments were developed for the retrieval of information in this study. The primary one was used in the review of cases in which physical evidence had been collected and examined in the crime laboratory. This "evidence" form evolved out of several months of development, field testing and consultation with the project advisory committee and experts in the field of forensic science. Several preliminary versions were pilot tested on cases in the field sites before the final version was found to be acceptable.

Crime Report - The evidence form is introduced with a number of items on the criminal incident: the type of crime, when and where it was committed, and who reported the offense to the police. Next, information about the case was sought at four levels, beginning with the initial police response/preliminary investigation.

Preliminary Investigation - The police response to a crime report is a very critical stage, both in terms of the chances for solving an offense, and the recognition and collection of physical evidence. It is at this stage that the police gather much of their information about suspects, witnesses and the crime itself. Based on the information

collected at this stage a decision is made to handle the incident either informally or through official channels, and to request the assistance of detectives, evidence technicians, or other support personnel. If the responding officer can settle the case, or if it appears that additional police resources would not resolve the case, then support personnel may not be called. Different departments also give patrol officers varying degrees of latitude in pursuing cases prior to turning them over to the detective decision.

Information was gathered from case reports on the number of witnesses to the crime, the "quality" of witness information (could the witness describe what occurred, could he/she identify the offender, or did he/she just have a fleeting or obstructed view of the events?), and the status of the identification of the suspect (was there any description of the suspect provided, was the suspect recognized or named by the witness, or was the suspect taken into custody immediately by the police?). It is especially important to know the status of the suspect's identity at the start of police involvement. Previous studies have shown that this information (about the suspect) is the best single predictor of whether a case will be solved.

Follow-up Investigation - The investigative level was the next stage of data collection. Here, information was gathered on police units involved in the investigation; techniques (such as records searches, canvases of the neighborhood, and line-ups) utilized by investigators; what kinds of physical evidence were collected; whether the case was cleared or not; and time elapsed until offenders were apprehended. Here, up to a maximum of three offenders were noted for on each case. This section

of the instrument was designed to find what steps taken by the police and types of information gathered helps solve crimes, and whether physical evidence contributes to the outcome.

Physical Evidence - The third section of the instrument dealt specifically with physical evidence. All forms of physical evidence were classified into 32 major "categories" (See the data collection instrument). Blood, hair, firearms, and fingerprints are each an example of a major category. Within a category more specific "types" are isolated. For example, fingerprints might include latent (not visible) prints, inked prints, and palmprints. The instrument was designed so that detailed information on up to four major categories of evidence would be recorded on a given case. Each category of evidence (up to four) which had physical evidence analyzed in the laboratory was given a "supplement." The supplement called for the collection of additional items of information about that category of evidence.

It was possible, on each supplement, to code up to five types of evidence for every major evidence category. For each type of evidence it was possible to record where it was collected, who collected it, and whether it was of known origin (a "standard") or of unknown origin (which was called "evidence"). For example, a latent print would be called "evidence" because it is not known who left the print. On the other hand, inked fingerprint cards from police files are "standards" i.e., the police know the identity of the person whose prints appear on the cards. Inked prints may be compared to latent prints to deduce the identity of the person who left the latents.

The supplement included up to three reasons why the evidence was collected (e.g., to identify an unknown suspect, or to associate a suspect with the crime scene or victim), up to three results of the laboratory analysis; e.g., an identification ("the substance is heroin"), classification ("the blood is type B"), conclusive common origin ("the latent print is the suspect's"), and up to three descriptions of the "value" of the evidence (e.g., it identified the suspect, associated the suspect with the crime scene or victim, or corroborated the statement of a witness). The supplement also permitted the recording of the overall "significance" of the evidence in the case. These categories are discussed in greater detail in Chapter III of the report. Finally, the time it took the laboratory to issue its report on the evidence was recorded.

Judicial Outcome - Although this study focused on the role of evidence at the police investigative stage, a limited amount of information at the judicial level was gathered. At this fourth level the initial and final charges against the offender were recorded, along with the disposition of the case, sentence, the length of incarceration (if any), and the time from commission of the crime to the time of final sentencing. As throughout the instrument, data were collected on up to three suspects/defendants.

Non-Physical Evidence Data Collection Instrument

A separate data collection instrument was developed to code the sample of cases where physical evidence was not collected or examined.

In essence, the no-evidence instrument is an abbreviated version of the more detailed evidence form. Case background information and essential items from the initial police response and investigative stages were included. The evidence supplements, of course, were unnecessary for these cases without physical evidence. The set of judicial level items, however, was left intact. The no-evidence form answers the basic questions, "what was the crime and when did it occur?", "were there any suspects?", "did the victim know the suspect?", "was the crime solved and the offender(s) arrested?", "how was the crime solved?" and "were the offenders convicted and sentenced for their crime?"

Coding of Cases and Checks on Reliability

Coding of the cases was done, for the most part, by the senior project staff (Research Associates Mihajlovic and Gilliland, and Principal Investigator Peterson). The Peoria and Chicago coding was done entirely by these three staff persons.

Coding in Kansas City was conducted during site visits by the project staff and assisted by a local criminal justice student who had experience working as an investigator with a federal agency. Coding in Oakland was accomplished by a graduate student who had been trained by the project staff. This graduate student supervised two additional students and the three coded all the evidence cases. The no-evidence cases in Oakland were coded by project staff during site visits.

The reliability of an instrument such as this, especially one so detailed, was a central concern to the project staff. For cases coded by the senior project staff, reliability problems are minimal. These

three were co-authors of the instrument, and had daily interaction during the coding of cases. It was possible for them to discuss subtleties in the instrument and to resolve problems encountered during coding in a manner that preserved consistency from case to case, and from coder to coder.

Reliability of cases coded by the student research assistants was assured in two ways. First, all workers had some prior knowledge of the field of criminal investigation and forensic science. One of the coders had worked as an investigator for the U.S. Department of Agriculture, another a recent law school graduate, and two others were in the field of public health. New coders spent several days being trained in the use of the instrument and coding cases with their work double checked by project staff.

As a second check on the reliability of student assistant cases, every form was thoroughly examined by one of the senior project staff before being entered into the computer data file. In this way, the internal consistency of the coding was verified. It should also be noted that police, laboratory and records management staff were available in each jurisdiction if questions arose concerning information contained in (or absent from) any of the case files. Such consultation was very helpful in interpreting procedures or terminology unique to an individual jurisdiction.

Sampling Techniques

A decision was made at the outset of the project to focus attention primarily on cases in which evidence had been collected from the field

and examined by the laboratory. Wherever possible departmental records were consulted to estimate the fraction of total crimes reported to the police in the different jurisdictions that resulted in a crime scene investigation and search for evidence. Laboratory records and case files were then consulted to estimate the fraction of crimes where evidence was submitted to the laboratory and an analyst actually examined the evidence. This study concentrated on those physical evidence cases which survived these two screening levels.

Basically, the study focused on the analysis of adult cases in the serious crime categories of homicide (and related death investigations), rape, robbery, aggravated assault/battery, burglary and arson. Of necessity, the case selection approach was modified to accommodate differences in individual sites, the priorities it assigned to various types of cases and its capabilities in examining various forms of physical evidence. A sampling approach was taken in selecting cases in the three largest jurisdictions (Chicago, Oakland and Kansas City), while in Peoria all crimes processed by the Morton Regional Laboratory submitted by the Peoria Police Department in specified crime categories over a four year period constituted the physical evidence sample.

Peoria - There are essentially three locations from which evidence cases were drawn in Peoria. First, every adult crime where physical evidence was submitted by the Peoria Police Department to the State Regional Laboratory in Morton, IL. from January 1976 through June 1980 (excluding drug cases) was selected.

Although not a Part I, it was decided to take a sample of the drug and narcotic offenses in each site, since these cases constitute such a

large portion of the total laboratory caseload. In Peoria, three out of every four cases submitted by the police department to the Morton regional laboratory involved a suspected drug or narcotic. Given the volume of these cases and their similarity in terms of what the laboratory is expected to do in each case, a sample of 50 cases was randomly selected over this same 1976-1980 time period.

Finally, evidence technicians in Peoria processed numerous scenes (primarily burglaries) in which the only physical evidence recovered was fingerprints. These fingerprints were analyzed by the technicians themselves, and were not sent to the laboratory (thus, they were excluded from the laboratory file search). About fifty of these "fingerprint-only" cases were randomly selected from the Peoria crime scene unit files from the year 1979, and they form the third component of Peoria evidence cases.

Chicago - The Chicago Police Department Crime Laboratory is made up of several quasi-autonomous sections: microanalysis, firearms, toolmarks, documents and chemistry. The polygraph section was not included in this study. Each section maintains its own records management and case numbering system. Since the evidence sample was to include only cases where physical evidence was analyzed, it was necessary to begin sampling by first consulting the records in each section of the laboratory and deriving a list of cases analyzed by that section. There was, unfortunately, no master list of cases that had been analyzed.

From each section of the laboratory fifty to seventy cases from the year 1979 that received laboratory analysis were randomly selected (cases were drawn without consideration for the type of crime). The

sampling strategy within the microanalysis section of the laboratory, however, was crime specific. Separate samples of burglary, robbery, assault/battery, rape and homicide cases were selected. The microanalysis section had two numbering and classification schemes, one for rape cases and one for all other crimes. For example, the list of rape cases was developed by selecting every third case which had received a complete analysis. The sample of homicide (other death related), assault, robbery and burglary cases was drawn by consulting the actual case files and drawing a random sample of cases which had been examined. In addition, a master code book of crime scenes processed was used to identify cases in which fingerprints were the only type of evidence collected. Approximately fifty of the fingerprint-only cases were randomly selected from the same year (1979).

Kansas City - The sampling of evidence cases in Kansas City was comparatively straightforward. The regional criminalistics laboratory in Independence, MO. maintained a master list (by crime type) of all cases submitted for the year 1979. Approximately fifty cases from each major crime type (homicide/ death, rape/sex crime, robbery, assault/battery, burglary/property crime, arson, fraud/forgery, and drugs) were obtained by random selection from the master laboratory list. Sometimes two and three times the number of cases actually needed were initially checked since it was found that not all cases submitted received an analysis. All cases shared the characteristic of having laboratory work done on the evidence and having a report written by a forensic examiner. The records management system in Kansas City did not allow for us to draw a random sample of fingerprint only cases.

Oakland - In Oakland, a random sample of cases with laboratory examined evidence from the years 1976 through 1980 was selected, so as to include about 50 cases from each of the major crime categories. In addition, a subset of drug cases from this period was included, as well as a subset of cases where fingerprints were the only form of evidence collected and analyzed.

General Search Strategies

The laboratory case file provided the police records division number for each incident. This number was the key identifier in locating all related police documents on the particular case. The most complex filing and numbering system was in Chicago where each laboratory section maintained its own numbering and cataloguing system. These identifiers were in addition to an evidence inventory number which was assigned to all physical evidence cases. The separate, section-based numbering systems did make the task of case review more complex, though, particularly in summarizing cases in which physical evidence had been routed to more than one section of the laboratory (e.g., a case involving firearms, blood and fingerprints).

After obtaining the police identification number, coding of the case began at the main police file. This file usually included the reports of all police units involved in the crime, from responding officer, to detectives, to evidence technicians. Often these main jackets included laboratory reports and court disposition data on the offenders as well. Following a complete review of this main file jacket, the next step was to return to the laboratory section where the

results of the laboratory analysis were filed. Copies of evidence technician and investigator reports were oftentimes included in this file, along with requests for particular analyses and questions about the evidence the investigators wanted answered. These were in addition to the examiner's report. In Chicago's microanalysis section a case file did not always contain an analyst's formal report, even though evidence had been examined. In these cases, the examiner's notes were consulted in order to determine the results of the laboratory testing.

The final step in coding each case was to inspect records of the prosecutor and/or court, to obtain charging, disposition and sentencing data on each offender. In Kansas City and Oakland, computerized systems were utilized to search records for this information, while in Peoria and Chicago all checks were made manually.

Sampling and Searching No-Evidence Cases

A sample of incidents in which physical evidence was neither collected nor examined was drawn to serve as a comparison group for the cases having physical evidence. A preliminary review of case files showed that practically all homicides and rapes had some type of physical evidence being collected. In homicides, there was usually always evidence collected at autopsy; in rapes, there was almost always an examination of the victim which yielded evidence. Arson was another crime category considered, but rejected since two of the sites did not examine physical evidence in these crimes. These crime types, therefore, were not candidates for the no-evidence comparison. A decision was made to draw the no-evidence cases from the crime categories of robbery, assault and battery, and burglary.

In Peoria the no-evidence sample was selected from cases where an evidence technician had responded to the crime scene but collected no-evidence. Similarly in Chicago, the sample was taken from cases where an evidence technician visited the scene but found no physical evidence. Therefore, in these scenes a patrol officer or detective had summoned a technician, but the search of the scene did not result in evidence being collected.

In Kansas City, a different strategy was employed due to the absence of a file of records, such as those available in Chicago or Peoria, where technicians had responded to the scene but found no evidence. Here, a computer printout of all robbery, assault/battery, and burglary/property crimes was obtained. From this master list a subset was randomly selected. Each case file was then checked in the police records division to determine if evidence had been recovered in the investigation. If there was no record of evidence being collected, that case was selected.

No such computer printout was available in Oakland. Evidence case numbers from the evidence sample were used as "seeds" to select the no-evidence sample. The procedure was as follows: starting with a case number from the evidence sample (the seed), the first crime of that type to appear before the seed, and the first to appear after was checked. In this way two no-evidence cases could be found for each evidence case. If the newly selected case turned out to have evidence collected it was discarded and the next nearest case of that crime type was drawn. (For some crime types it was necessary to select the nearest two cases of that crime on either side of the seed, to assure a sufficiently large sample size.)

Data Entry and File Setup

The first step in the data processing was to keypunch the raw data into the computer. After this was accomplished, the next step involved eliminating coding and keypunching errors. After the data were thoroughly cleaned, SPSS (Statistical Package for the Social Sciences) computer files were set up to help facilitate data analysis.

APPENDIX A-3

UTILIZATION OF FORENSIC SCIENCES IN POLICE INVESTIGATIONS
PROJECT CODEBOOK

<u>TABLE</u>	<u>INSTRUCTIONS</u>	<u>COLUMNS</u>
100	<p>City/Project Control Number</p> <p>Enter 1 = Peoria 3 = Kansas City 2 = Chicago 4 = Oakland</p> <p>Code sheets should also be numbered consecutively within each city beginning with the number 001 in columns 2-4.</p>	1-4
01	<p>Police Report Number</p> <p>Enter the Police Incident number, right justified.</p>	5-12
02	<p>Laboratory Case Number</p> <p>Enter the Laboratory Case number, right justified.</p>	13-19

THE FOLLOWING INFORMATION SHOULD BE RECORDED ON THE CODING SHEET BUT IT WILL NOT BE CODED OR COMPUTERIZED

- A Court Docket Number
Enter the Court Docket number if available.
- B Arrest Number
Enter the agency Arrest number for any arrested offenders.
- C Central Booking Number
Enter the Central Booking Number if available.
- D Offender(s) Name(s), Race(s) and Date(s) of Birth
Enter the full name (last name, first name) of each Offender listed. Also include the race of the Offender and date of birth, up to a maximum of three persons.

*** As a policy throughout the data collection, when an "other" is coded on the data collection form, write in the actual response next to the variable on the data collection form.

103

Offense Classification

20-21

Enter Code for appropriate crime category. If offense is not included in the listing, enter 88 (other) and record the offense class in the space provided. If more than one offense is cited on the report, code the most serious offense and record the codes of any additional offenses.

Enter 00 = Not Applicable	20 = Aggravated Arson
01 = Murder	21 = Arson
02 = Attempted Murder	22 = Attempted Arson
03 = Voluntary Manslaughter	23 = Controlled Substance Related
04 = Involuntary Manslaughter	24 = Unlawful Use of Weapons
05 = Reckless Homicide	25 = Fraud/Forgery
06 = Rape	26 = Stolen Property Possession
07 = Attempted Rape	27 = Criminal Damage to Property
08 = Armed Robbery	81 = Other Sex Offenses (e.g. deviant sexual assault)
09 = Attempted Armed Robbery	82 = Other Firearms Related
10 = Robbery	83 = Other Death Investigations (e.g. suicide, body found)
11 = Attempted Robbery	84 = Other Personal Crimes
12 = Aggravated Assault	85 = Other Property Crimes
13 = Simple Assault	86 = Other Services Performed
14 = Aggravated Battery	87 = Mala Prohibita Crimes (e.g. prostitution, gambling)
15 = Simple Battery	88 = Other (record)
16 = Burglary	99 = Unknown
17 = Attempted Burglary	
18 = Theft	
19 = Attempted Theft	

104

Incident Code

22-25

Enter the incident/crime code from the police report, right justified. If unknown, enter 9999.

THE FOLLOWING VARIABLES 105-109 REFER TO THE TIME THE CRIME IS REPORTED TO THE POLICE/TIME OF ARRIVAL OF FIRST OFFICER ON THE SCENE. THE INDEX USED WILL DEPEND ON THE REPORTING METHOD OF THE PARTICULAR CITY.

105

Day of Week

26

Enter 1 = Sunday	5 = Thursday
2 = Monday	6 = Friday
3 = Tuesday	7 = Saturday
4 = Wednesday	9 = Unknown

106

Month

27-28

Enter 01 = January	06 = June	10 = October
02 = February	07 = July	11 = November
03 = March	08 = August	12 = December
04 = April	09 = September	99 = Unknown
05 = May		

107

Day of Month

29-30

Enter the day of the month. Enter 99 if unknown.

108

Year

31-32

- 109 Hour 33-34
- Enter 00 = 0000-0059 (12-1 AM) 12 = 1200-1259 (12-1 PM)
 01 = 0100-0159 (1-2) 13 = 1300-1359 (1-2)
 02 = 0200-0259 (2-3) 14 = 1400-1459 (2-3)
 03 = 0300-0359 (3-4) 15 = 1500-1559 (3-4)
 04 = 0400-0459 (4-5) 16 = 1600-1659 (4-5)
 05 = 0500-0559 (5-6) 17 = 1700-1759 (5-6)
 06 = 0600-0659 (6-7) 18 = 1800-1859 (6-7)
 07 = 0700-0759 (7-8) 19 = 1900-1959 (7-8)
 08 = 0800-0859 (8-9) 20 = 2000-2059 (8-9)
 09 = 0900-0959 (9-10) 21 = 2100-2159 (9-10)
 10 = 1000-1059 (10-11) 22 = 2200-2259 (10-11)
 11 = 1100-1159 (11-12) 23 = 2300-2359 (11-12)
- 110 Approximate Time Elapsed Between Commission/Occurrence of Crime 35
 (if range is give, use the latest time given on police report)
 and the Report to the Police/Arrival of First Officer.
- Enter 0 = Not Applicable 3 = More than 1 hour
 1 = Up to 10 minutes 9 = Unknown
 2 = 10+ to 60 minutes
- 111 Crime Scene-Type of Location (Where Did the Crime Occur?) 36-37
- Enter 00 = Not Applicable PUBLIC
 RESIDENTIAL 15 = School/College
 01 = Single Family Dwelling- 16 = Other Public
 Indoors OUTSIDE
 02 = Single Family Dwelling- 17 = Park/Recreation Area
 Outdoors 18 = Street/Highway/Sidewalk/
 Parking Lot
 03 = Multiple Family Dwelling- 19 = Public Transportation
 Private Area 20 = Private Vehicle
 04 = Multiple Family Dwelling- 88 = Other
 Public Area 99 = Unknown
 05 = Other residential
 COMMERCIAL
 06 = Hotel/Motel
 07 = Restaurant/Bar
 08 = Liquor/24 Hour/Party/
 Convenience Store
 09 = Food/Grocery Store
 10 = Gas Station
 11 = Retail Store
 12 = Office
 13 = Industrial
 14 = Other Commercial
- 112 Premises Code 38-40
- Enter the crime scene/premises code from the police report.
 Enter 000 if not applicable, enter 999 if unknown.
- 113 Source of Report to the Police/Who Reported the Crime 41
- Enter 0 = Not Applicable 5 = Public Police
 1 = Victim 6 = Anonymous
 2 = Witness 7 = Alarm
 3 = Other Citizen 8 = Other (record)

114	<p>Original Condition of Crime Scene (cleanliness, orderliness, etc.)</p> <p>Enter-0 = Not Applicable (no crime "scene" as such) 1 = Indoors--scene noted as dirty, disorderly 2 = Indoors--no mention of condition of scene 3 = Indoors--scene noted as being clean, straightened 4 = Outdoors--scene noted as dirty, disorderly 5 = Outdoors--no mention of condition of scene 6 = Outdoors--scene noted as being clean, straightened 8 = Other (record) 9 = Unknown</p>	42
<p>THE FOLLOWING VARIABLES 115-116 ASK WHETHER THERE WAS APPRECIABLE PHYSICAL CONTACT BETWEEN THE OFFENDER AND ENVIRONMENT (SCENE OR VICTIM) SUCH THAT AN EXCHANGE OR TRANSFER OF PHYSICAL MATERIAL WOULD BE EXPECTED</p>		
115	<p>Interaction Between Offender and Crime Scene</p> <p>Enter 0 = Not Applicable (no crime "scene" as such) 1 = Yes, there was interaction 2 = No interaction 9 = Unknown</p>	43
116	<p>Interaction Between Offender and Victim</p> <p>Enter 0 = Not Applicable (no "victim" as such) 1 = Yes, there was interaction 2 = No interaction 9 = Unknown</p>	44
117	<p>Was There Protection/Securing of the Crime Scene Following Commission of the Crime?</p> <p>Enter 0 = Not Applicable (no crime "scene" as such) 1 = Protection/securing of the scene noted in police report 2 = Notation in police report that there was <u>no</u> protection/securing of the scene 3 = Evidence contaminated/destroyed by persons 4 = Evidence contaminated/destroyed by the weather 5 = Victim cleans up scene or self (rape victim) 8 = Other (record) 9 = Unknown</p>	45
119	LEAVE THESE COLUMNS BLANK	46-49

THE VARIABLES 120-121 ADDRESS THE SERIOUSNESS OF THE CRIME. ENTER THE APPROPRIATE CODE FOR THE EXTENT OF THE INJURY OR PROPERTY LOSS SUSTAINED. IN CASE OF SO-CALLED "VICTIMLESS" CRIMES (E.G., DRUGS, GAMBLING, ETC.) ENTER "7" UNDER PERSONAL INJURY AND "0" UNDER PROPERTY LOSS

20 Personal Injury 50

- Enter 0 = Not Applicable (not a crime against persons)
- 1 = No injury
- 2 = Minor injury (medical treatment not required)
- 3 = Serious-1 (victim examined by medical personnel for primary purpose of evidence recovery)
- 4 = Serious-2 (doctor or emergency room treatment)
- 5 = Serious-3 (hospitalization required)
- 6 = Death
- 7 = Vice related/no loss
- 8 = Other (record)
- 9 = Unknown

121 Approximate Total Property Loss or Damage (cash value) 51
Record the Actual Value

- Enter 0 = Not Applicable
- 1 = Less than \$100
- 2 = \$101 to \$200
- 3 = \$201 to \$500
- 4 = \$501 to \$1000
- 5 = \$1001 to \$5000
- 6 = More than \$5000
- 8 = Other (record)
- 9 = Unknown

22 Total Number of Suspects/Offenders In This Incident 52

- Enter 0 = None/Not Applicable
- 1-7 = Actual number of offenders
- 8 = Other (more than 7 offenders)
- 9 = Unknown

23 Total Number of Witnesses (persons who observed the incident or saw the suspect/offender near the time of the incident). The Victim should be counted as a witness if he/she saw the incident or offender and related the information to the police. If police witnessed incident/offender, count them also. 53

- Enter 0 = None/Not Applicable
- 1-7 = Actual number of witnesses
- 8 = Other (more than 7 witnesses)
- 9 = Unknown

24 Did the Victim(s) Relate Any Eye-Witness Information About Incident 54

- Enter 0 = Not Applicable
- 1 = Yes
- 2 = No
- 9 = Unknown

25	Status of Identification of Offender #1 By Victim/Witness at Time the Search for Evidence Took Place. (If offender in custody, record "8" and write in on code sheet.)	55
	Enter 0 = Not Applicable 1 = No Description 2 = General Description (height, sex, race, clothing) 3 = Detailed Description (e.g., scars, tatooes, facial hair) 4 = Offender recognized but <u>not</u> identified (named) 5 = Offender recognized, <u>not</u> identified, but address or place of employment provided 6 = Offender identified (named) 7 = Offender identified <u>and</u> address or employment provided 8 = Other (including in custody) 9 = Unknown	
25	Status of Identification of Offender #2 by Victim/Witness	56
27	Status of Identification of Offender #3 by Victim/Witness	57
128	Victim/Witness's Recollection of the Incident	58
	Enter 0 = Not Applicable--victim/witness did not see crime 1 = Vague--Victim/Witness caught fleeting glimpse of offender/ crime; victim/witness unable to provide information about the movements of the offender or what he may have touched or moved 2 = Moderate Detail--victim/witness has good recollection of incident and actions of offender, and can describe his movements during the commission of the crime 3 = Good Detail--victim/witness essentially viewed the entire incident, provides a very detailed account of the offense and is able to provide specific information about the actions of the offender, what he touched, moved, repositioned, or left behind 8 = Other (record) 9 = Unknown	
	THE VARIABLES 129-131 ASK FOR THE ELAPSED TIME BETWEEN WHEN THE CRIME WAS REPORTED TO THE POLICE/POLICE ARRIVAL AT THE SCENE AND THE APPREHENSION OF THE SUSPECT/OFFENDER. USE THE FOLLOWING CODE:	
	Enter 0 = N.A./no suspect apprehended 1 = Up to 10 minutes 2 = 10 + to 60 minutes 3 = 1+ to 24 hours 4 = 1+ to 30 days 5 = More than 1 month 9 = Unknown when suspect/ offender apprehended.	
29	Time From Report/Arrival to Apprehension of Suspect/Offender #1	59
30	Time From Report/Arrival to Apprehension of Suspect/Offender #2	60
31	Time From Report/Arrival to Apprehension of Suspect/Offender #3	61
32	Victim/Offender Relationship	62
	Enter 0 = Not Applicable (no victim) 1 = Family/Relative 2 = Friend/Acquaintance 3 = Strangers 9 = Unknown	

TABLEINSTRUCTIONSCOLUMNS

BEGIN CARD TWO

00	City/Project Control Number	1-4
01	Types of Units Involved in This Investigation (this includes incidents where the offender is apprehended immediately and those where he is being sought)	5
02		6
203		7
	LIST UP TO THREE UNITS	
	Enter 0 = Not Applicable (no follow up)	5 = Tactical Team
	1 = Patrol Officer	6 = Bomb/Arson Squad
	2 = Detective	7 = Mobile Unit
	3 = Evidence Technician	8 = Other (record)
	4 = Medical Examiner/Coronor	9 = Unknown
	THE FOLLOWING SECTION ADDRESSES THE VARIOUS INVESTIGATIVE TECHNIQUES WHICH THE POLICE MAY UTILIZE IN INVESTIGATING THE CRIME. USE THE FOLLOWING CODES FOR VARIABLES 204-216:	
	Enter 0 = Not Applicable (not used)	
	1 = Used and <u>useful</u> information developed	
	2 = Used but <u>no useful</u> information developed	
	8 = Other (record)	
	9 = Unknown	
204	Re-Interview of the Victim, Witness, or Other Person (following the initial report taken by the initially responding officer)	8
205	Search of Law Enforcement, Forensic Laboratory, or Other Public or Private Records	9
206	Informant(s)/Anonymous "tip"	10
07	Canvass of the Neighborhood	11
208	Interrogation of Suspect(s)	12
09	Polygraph Examination of Suspect/Victim/Witness/Other (circle who examined)	13
10	Photographs (mugshots or other photos of possible suspects)	14
211	Line Up	15
212	Artist's Sketch	16
13	Vehicle Description/License Plate Check	17
214	Hospital Personnel Examination (doctors/nurses conduct examinations which yield physical evidence)	18
215	Scientific Evidence--Physical Evidence (includes cases where an autopsy is conducted)	19

17	Outcome of Investigation (letters stand for Peoria Clearance Code)	21-22
	Enter 01 = Unfounded (A)	
	02 = Referred to responsible jurisdiction (B)	
	03 = Offense cleared by arrest of adult (C)	
	04 = Offense cleared by arrest of juvenile (D)	
	05 = Failed to file a complaint or to prosecute as an adult (E)	
	06 = Complaint/Warrant refused by prosecutor (F)	
	07 = Complaint/Warrant refused by court (G)	
	08 = Prosecuted for another offense (H)	
	09 = Failed to file a complaint or to prosecute as a juvenile (I)	
	10 = All other exceptional clearance--adult (J)	
	11 = Offender deceased (K)	
	12 = Located or returned home (L)	
	13 = All other exceptional clearance--juvenile (M)	
	14 = Not cleared (N)	
	88 = Other (record)	
	99 = Unknown	
18	Time Elapsed Between Report to Police/Arrival of Police at Scene and Case Clearance or Closure (this includes both cases where a the crime is cleared through an apprehension and where the incident is closed or suspended due to a lack of suspects or leads)	23-24
	Enter 00 = Not Applicable (case not cleared or closed)	
	01 = Up to 10 minutes	
	02 = 10+ to 60 minutes	
	03 = 1+ to 24 hours	
	04 = 1+ to 30 days	
	05 = More than 1 month	
	99 = Unknown	
19	Dominant Investigative Techniques Utilized in This Incident Which	25-26
20	Lead to Clearance of the Crime (put first <u>key</u> event first, etc.)	27-28
21	LIST UP TO THREE TECHNIQUES IN ORDER OF IMPORTANCE	29-30
	Enter 00 = Not Applicable (crime not cleared)	
	01 = Crime observed in progress by police	
	02 = Crime observed in progress by citizen	
	03 = Offender apprehended at or near crime scene/location	
	04 = General description of offender/suspect	
	05 = Detailed description of offender/suspect	
	06 = Offender/suspect recognized but not named.	
	07 = Offender/suspect recognized and address/employment known	
	08 = Offender/suspect identified (named)	
	09 = Offender/suspect named and address/employment given	
	10 = Offender/suspect identified through photographs	
	11 = Offender/suspect identified in a line-up	
	12 = Artist's sketch	
	13 = Description of vehicle or license plate number	
	14 = Citizen "tip" (including anonymous calls)	
	15 = Information from informant or unknown source	
16	Recovered stolen property	23 = Suspect's admission
17	Traffic Stop	24 = Suspect recalled from previous crime
18	Modus Operandi recognized by investigator	25 = Suspect surrendered to police
19	Warrant	26 = Suspect apprehended at hospital
20	Physical evidence/crime lab results	27 = Undercover work
21	Medical examiner's/Coroner's results	

222	What Locations/Persons Received a Search for Evidence	31
	Enter 0 = Not Applicable 1 = Crime scene only 2 = Crime scene, suspect(s) and victim(s) 3 = Crime scene and suspect(s) 4 = Crime scene and victim(s)	5 = Suspect(s) only 6 = Victim(s) only 7 = Suspect(s) and victim(s) 8 = Other (record) 9 = Unknown
223	How Many Different <u>Scenes</u> or <u>Locations</u> (including vehicles) Were Searched in This Investigation? (Do <u>not</u> include victims)	32
	Enter 0 = None/Not Applicable 1-7 = Actual Number 8 = Other (greater than 7) 9 = Unknown	
224	Personnel Present When Crime Scene Search Was Conducted	33
225	LIST UP TO THREE	34
226	Enter 0 = None/Not Applicable 1 = Evidence Technician/ Mobile Unit 2 = Patrol Officer 3 = Detective 4 = Supervisory (Sgt. or above)	5 = Criminalistics lab personnel 6 = Medical Examiner/ Coroner 7 = Bomb & Arson Squad 8 = Other (record) 9 = Unknown
227	Approximate Time Devoted by Evidence Technician to the Search of the (primary) Crime Scene and Collection of Physical Evidence	36
	Enter 0 = Not Applicable 1 = up to 10 minutes 2 = 10+ to 60 minutes	3 = More than 1 hour 9 = Unknown
228	Total Number of Evidence CATEGORIES (in all capital letters) Collected or Noted in this Case (refer to list on page 13)	37-38
	Enter 00 = None/Not Applicable 01-87 = Actual Number 88 = Other (more than 87) 99 = Unknown	
9-238	List the Various CATEGORIES of Evidence Which Were <u>Collected</u> in this Particular Case	39-58
	LIST UP TO 10 CATEGORIES FROM LIST ON PAGE 13	
39-243	Additional Categories of Evidence Noted or Described in the Technician's Crime Scene Report Which Were Not Collected	59-68
	LIST UP TO FIVE CATEGORIES FROM LIST ON PAGE 13	
244	Number of Contacts Made Between Investigators and Laboratory Examiners During this Case	69
	Enter 0. = None/Not Applicable 1-7 = Actual Number	8 = Other (more than 7 contacts) 9 = Unknown

BEGIN CARD THREE

MOST OF THE INFORMATION ON THIS CARD WILL BE COLLECTED FROM COURT RECORDS. THEREFORE, LEAVE BLANK ANY VARIABLES THAT CANNOT BE FILLED OUT FROM THE POLICE CASE FILE. THESE WILL BE FILLED IN WHEN THE COURT FILES ARE EXAMINED.

IF THERE ARE MORE THAN THREE DEFENDANTS IN ANY CASE, CODE THE INFORMATION FOR THE THREE MOST RELEVANT (IN YOUR OPINION) DEFENDANTS. WRITE IN THE INFORMATION FOR ANY ADDITIONAL DEFENDANTS

300	City/Project Control Number	1-4
FOR VARIABLES 301-306, REFER TO LIST OF CHARGES UNDER V306		
301	Initial Charge Filed Against Defendant #1	5-6
302	Initial Charge Filed Against Defendant #2	7-8
303	Initial Charge Filed Against Defendant #3	9-10
304	Final Charge Filed Against Defendant #1	11-12
305	Final Charge Filed Against Defendant #2	13-14
306	Final Charge Filed Against Defendant #3	15-16

Enter Code for appropriate charge category. If charge is not included in the listing, enter 88 (other) and record the charge in the space provided. If more than one charge is cited, code the most serious charge and record the codes of any additional charges.

Enter 00 = Not Applicable	20 = Aggravated Arson
01 = Murder	21 = Arson
02 = Attempted Murder	22 = Attempted Arson
03 = Voluntary Manslaughter	23 = Controlled Substance Related
04 = Involuntary Manslaughter	24 = Unlawful Use of Weapons
05 = Reckless Homicide	25 = Fraud/Forgery
06 = Rape	26 = Stolen Property Possession
07 = Attempted Rape	27 = Criminal Damage to Property
08 = Armed Robbery	28 = Charged/Prosecuted for Other Offense
09 = Attempted Armed Robbery	81 = Other Sex Offenses
10 = Robbery	82 = Other Firearms Related
11 = Attempted Robbery	83 = Other Deaths (include suicide)
12 = Aggravated Assault	84 = Other Personal Crime
13 = Simple Assault	85 = Other Property Crime
14 = Aggravated Battery	86 = Other Services Performed
15 = Simple Battery	87 = Other Mala Prohibita Crimes
16 = Burglary	88 = Other-(specify on code sheet)*
17 = Attempted Burglary	99 = Unknown
18 = Theft	
19 = Attempted Theft	

TABLEINSTRUCTIONSCOLUMNS

07	Disposition of Final Charge Against Defendant #1	17-18
308	Disposition of Final Charge Against Defendant #2	19-20
09	Disposition of Final Charge Against Defendant #3	21-22

Enter 00 = Not Applicable

01 = Nolle Pros

02 = Discharged at Preliminary Hearing--no probable cause

03 = Dismissed on motion of defendant

04 = Dismissed on motion of prosecutor

05 = Reduced on motion of prosecutor to misdemeanor

06 = Acquitted by Court

07 = Acquitted by Jury

08 = Convicted of an included misdemeanor

09 = Plea (blind--code 09 unless explicit mention of negotiation)

10 = Plea (negotiated)

11 = Convicted by Court

16 = Stricken on leave to reinstate

12 = Convicted by Jury

17 = Bond Forfeiture/Warrant

13 = Dismissed by Court

18 = Self defense

14 = Mistrial

19 = D.A. Citation

15 = Defendant Committed

20 = Prosecuted for other offense

88 = Other (record)

99 = Unknown

310	Sentence Imposed on Defendant #1	23-24
11	Sentence Imposed on Defendant #2	25-26
312	Sentence Imposed on Defendant #3	27-28

Enter 00 = Not Applicable

01 = Death

02 = Imprisonment (State Penitentiary)

03 = Imprisonment (jail)

04 = Imprisonment and fine/costs

05 = Fine/Costs

06 = Probation

07 = Probation with conditions

(jail, fine, restitution, etc.)

08 = Restitution

09 = Unfit for sentencing

10 = Court supervision

11 = Work release

12 = Committed

88 = Other (record)

99 = Unknown

13	If Confinement--Minimum Length of Sentence for Defendant #1	29-30
314	If Confinement--Minimum Length of Sentence for Defendant #2	31-32
15	If Confinement--Minimum Length of Sentence for Defendant #3	33-34
316	If Confinement--Maximum Length of Sentence for Defendant #1	35-36
17	If Confinement--Maximum Length of Sentence for Defendant #2	37-38
318	If Confinement--Maximum Length of Sentence for Defendant #3	39-40

Enter 00 = Not Applicable (no confinement)

01-83 = Actual number of years

84 = Up to 1 month

85 = 1+ to 6 months

86 = 6+ to <1 year

87 = Life

88 = Other (more than 83 years)

99 = Unknown

<u>VARIABLE</u>	<u>INSTRUCTIONS</u>	<u>COLUMNS</u>
319	Month of Final Disposition of Defendant #1	41-42
320	Month of Final Disposition of Defendant #2	43-44
321	Month of Final Disposition of Defendant #3	45-46
	Enter 00 = Not Applicable 07 = July	
	01 = January 08 = August	
	02 = February 09 = September	
	03 = March 10 = October	
	04 = April 11 = November	
	05 = May 12 = December	
	06 = June 99 = Unknown	
322	Date of Month of Final Disposition of Defendant #1	47-48
323	Date of Month of Final Disposition of Defendant #2	49-50
324	Date of Month of Final Disposition of Defendant #3	51-52
325	Year of Final Disposition of Defendant #1	53-54
326	Year of Final Disposition of Defendant #2	55-56
327	Year of Final Disposition of Defendant #3	57-58
328	Outcome of Appeal of Defendant #1	59
329	Outcome of Appeal of Defendant #2	60
330	Outcome of Appeal of Defendant #3	61
	Enter 0 = Not Applicable (no trial)	
	1 = Appeal--lower court decision sustained	
	2 = Appeal--lower court decision reversed	
	3 = No appeal of verdict (no mention of appeal)	
	4 = Appeal--outcome unknown	
	8 = Other (record)	
	9 = Unknown	

END CARD THREE

WHAT FOLLOWS REFER TO CARDS 4-7, THE EVIDENCE SUPPLEMENT. A SUPPLEMENT WILL BE FILLED OUT FOR EACH CATEGORY OF PHYSICAL EVIDENCE THAT IS COLLECTED AND ANALYSED. IF MORE THAN FOUR CATEGORIES OF EVIDENCE ARE COLLECTED AND ANALYSED, FILL OUT A SUPPLEMENT ONLY FOR THE FOUR MOST IMPORTANT CATEGORIES. RECALL THAT A "CATEGORY" APPEARS IN ALL CAPITAL LETTERS IN THE LIST ON PAGE 13.

ALTHOUGH THE VARIABLES ARE NUMBERED BEGINNING WITH 400, IT IS UNDERSTOOD THAT SUBSEQUENT EVIDENCE SUPPLEMENTS FROM EACH CASE WILL BEGIN WITH VARIABLES 500, 600 and 700.

IF CERTAIN VARIABLES CANNOT BE ANSWERED FROM INFORMATION AVAILABLE IN THE POLICE REPORTS, LEAVE THEM BLANK UNTIL THE LABORATORY REPORTS ARE EXAMINED. ONLY AFTER BOTH POLICE AND LAB REPORTS ARE EXAMINED SHOULD ANY VARIABLES BE CODED 99 (UNKNOWN).

<u>RIABLE</u>	<u>INSTRUCTIONS</u>	<u>COLUMN</u>
00	City/Project Control Number	1-4
01	Nature of Physical Material	5

Enter 1 = Evidence 3 = Both Evidence and Standards
 2 = Standard/Known* 9 = Unknown

*Standards and Knowns include any material whose origin is known, examples include: inked or elimination prints taken from a person whose identity is known; blood taken from a victim or suspect whose identity is known; a shoe print made with the shoe of a known person; bullets fired from a weapon by an examiner in a laboratory; paint removed from an automobile to compare with that found at a crime scene.

02	CATEGORY of Evidence/Standard That This Supplement Records SELECT APPROPRIATE CATEGORY (IN CAPITAL LETTERS) FROM LIST BELOW	6-7
----	--	-----

3-407	Types of Evidence/Standard Within the Major Category (LIST UP TO FIVE) SELECT APPROPRIATE TYPES FROM THE LIST BELOW. "TYPE" REFERS TO THOSE RESPONSES IN SMALL LETTERS, OR IN CAPITAL LETTERS	8-17
-------	--	------

- | | |
|--|--|
| 00 = Not Applicable | 34 = FIBERS |
| 01 = ALCOHOL | 35 = FIRE RELATED |
| 02 = BLOOD | 36 = accelerants |
| 03 = BIOLOGICAL, OTHER | 37 = debris |
| 04 = perspiration | 38 = igniters |
| 05 = saliva | 39 = GLASS/PLASTICS |
| 06 = urine | 40 = HAIR |
| 07 = vaginal | 41 = animal |
| 08 = feces | 42 = human body |
| 09 = CLOTHING AND CLOTH | 43 = human head |
| 10 = CONSTRUCTION/PACKAGING MATERIAL | 44 = human pubic |
| 11 = CONTAINERS | 45 = IMPRESSIONS AND TRACKS (shoe,tire,fabric) |
| 12 = COSMETICS | 46 = METALS |
| 13 = DOCUMENTS, QUESTIONED | 47 = PAINT |
| 14 = alterations/erasures/obliterations/
indented writing | 48 = PATTERNS |
| 15 = handwriting/printing | 49 = PHOTOGRAPHS |
| 16 = burned/charred documents | 50 = crime scene |
| 17 = inks/pens/markers | 51 = laboratory |
| 18 = paper | 52 = suspect |
| 19 = typewriting/typewriters/
mechanical impressions | 53 = vehicle |
| 20 = DRUGS/NARCOTICS | 54 = victim |
| 21 = DUST/TRACE | 55 = POISONS |
| 22 = EXPLOSIVES/RESIDUE | 56 = RESIDUES |
| 23 = FIREARMS AND AMMUNITION RELATED | 57 = SAFE INSULATION |
| 24 = bullets | 58 = SEMEN |
| 25 = cartridges/cases | 59 = SERIAL NUMBERS |
| 26 = firearms | 60 = SOILS AND MINERALS |
| 27 = gunshot residue | 61 = TOOLS/TOOLMARKS |
| 28 = powder/shot patterns | 62 = VEHICULAR ACCIDENT RELATED |
| 29 = FINGERPRINTS AND PALMPRINTS | 63 = WEAPONS (OTHER THAN FIREARMS) |
| 30 = elimination | 64 = WOOD FRAGMENTS/VEGETATIVE MATERIALS |
| 31 = inked | 65 = MISC. ORGANIC |
| | 66 = MISC. INORGANIC |
| | 88 = OTHER (record |

VARIABLEINSTRUCTIONSCOLUMN

- 08-412 Location or Matrix From Which the Evidence or Standard Was Recovered. Select the Most Specific One Available 18-27
- LIST THE LOCATION FOR EACH TYPE OF EVIDENCE RECORDED IN VARIABLES 403-407
- | | |
|---|--|
| Enter 00 = Not Applicable | Victim |
| 01 = Police files/records
(e.g. fingerprints) | 19 = Shoes |
| 02 = Laboratory files/records
(in-house standards) | 20 = Vehicle |
| 03 = Residential Crime Scene | 21 = Other (record) |
| 04 = Outside | 22 = Suspect (suspect's possession) |
| 05 = Inside | 23 = Body |
| 06 = Point of Entry/Exit | 24 = Clothing--underwear |
| 07 = Target Area of Crime | 25 = Clothing--outerwear |
| 08 = Other (record) | 26 = Shoes |
| 09 = Non-Residential Crime Scene | 27 = Vehicle |
| 10 = Outside | 28 = Other (record) |
| 11 = Inside | 29 = Park/recreation area |
| 12 = Point of Entry/Exit | 30 = Street/highway/sidewalk/parking lot |
| 13 = Target Area of Crime | 31 = Container |
| 14 = Other (record) | 32 = Tool |
| 15 = Victim (victim's possession) | 33 = Firearm |
| 16 = Body | 34 = Weapon (other than firearm) |
| 17 = Clothing--underwear | 35 = Document |
| 18 = Clothing--outerwear | 88 = Other (record) |
| | 99 = Unknown |
- 13-417 Indicate For Each Type and Location (In the Previous Sets of Variables) Whether Material Was Evidence or Standard 28-32
- | | |
|--------------------------|--------------------------------|
| Enter 0 = Not Applicable | 3 = Both evidence and standard |
| 1 = Evidence | 9 = Unknown |
| 2 = Standard | |
- 18-422 Indicate Who Collected Each Type of Evidence/Standard 33-42
- | | |
|----------------------------|---------------------------|
| Enter 00 = Not Applicable | 09 = Jailer |
| 01 = Clerical | 10 = Prosecutor |
| 02 = Patrol Officer | 11 = Public Defender |
| 03 = Detective | 12 = Tactical Unit |
| 04 = Evidence Technician | 13 = Private Police |
| 05 = Mobile Crime Unit | 14 = Bomb and Arson Squad |
| 06 = Criminalist | 88 = Other (record) |
| 07 = Coroner/M.E. | 99 = Unknown |
| 08 = Hospital/Doctor/Nurse | |

423-425

What Were the Primary Reasons the Physical Evidence Was Collected and the Examination Requested?

43-48

LIST UP TO THREE REASONS IN ORDER OF IMPORTANCE

Enter 00 = Not Applicable

- 01 = Establish Element of the Crime--examples would be cases of suspected drug possession where the identification of the substance is the crucial item of information required to prove the crime. Other examples would be finding the presence of semen within a rape victim to prove penetration; the finding of an accelerant at the scene of a suspicious fire to prove the fire was of incendiary origin; or showing that a document has been forged.
- 02 = Reconstruction--evidence which helps to determine how a crime occurred and to reconstruct the actions of the offender, victim, vehicle or instrument of the crime. A powder pattern on the shirt of a shooting victim indicates he was shot at very close range, for example.
- 03 = Identify the Victim--taking of fingerprints from a homicide victim for the purpose of identifying him is an example.
- 04 = Identify the Suspect--recovery of latent fingerprints at the crime scene for the purpose of identifying an unknown suspect. Only select this category when there are no suspects, or where the task is to identify the offender from among more than one suspect.
- 05 = Identify/Classify the Instrument of the Crime--select this category only when the instrument/weapon is not recovered. Examples include examination of toolmarks to determine the type of tool used; examination of a bullet removed from a victim to determine the caliber or type of firearm.
- 06 = To Associate the Offender with the Crime Scene--typical examples include finding glass in the pant cuff of a burglary suspect which matches broken glass from the window of the crime scene, or finding latent fingerprints which link a suspect to the crime scene.
- 07 = To Associate the Offender with the Victim--for example, discovery of pubic hair on a rape victim matching that of the suspect; or finding blood consistent with the victim on the suspect's clothing.
- 08 = To Associate the Offender with the Instrument of the Crime--finding the offender's fingerprints on the murder weapon, or restoration of a serial number on a firearm left at the scene to determine its owner; or concluding the suspect effected the signature on a forged document.
- 09 = To Associate the Victim with the Crime Scene--where trace evidence found on a rape victim is consistent with debris found in the back of a van thought to be the location where the rape occurred.
- 10 = To Associate the Victim/Crime Scene with the Instrument of the Crime--for example, showing a bullet removed from a shooting victim was fired from a particular hand gun.

cont.

- 02 = Common Origin-Conclusive--the classical example is where a latent fingerprint is determined to be that of the suspect and no one else. Toolmarks and bullet comparisons are also examples where conclusive common origin is proven.
- 03 = Common Origin-Probable--situations where an examiner conducts a series of tests on two samples and finds them identical (indistinguishable) in all respects may lead him to conclude the two items probably had a common origin. However, the examiner would not say the two shared a common origin at the exclusion of all other possibilities.
- 04 = Common Origin-Possible--here the examiner has usually conducted fewer tests and is not as certain of the origin of the evidence. Language commonly used is that two samples are "consistent" with one another. Examination of similar hair samples frequently results in such a conclusion
- 05 = Different Origin--where an examination leads the scientist to conclude that the items of evidence did not have a common origin; for example, the bloodstain is "inconsistent" with that of the victim's; the bullet was not fired from the suspect's weapon; the composition of the paint is inconsistent with that on the suspect's automobile.
- 06 = Classification--where evidence is merely classified, as where hair found on the victim's clothing is shown to be cat hair; or the toolmark was made by a 2" diameter pry bar.
- 07 = Identification--The common examinations where a substance is determined to be marijuana, cocaine, heroin or other suspected controlled substance. Other examples are where a liquid is identified as being gasoline, or metal shavings on the pant leg of a suspect is identified as being copper.
- 08 = Negative Identification--this would be a situation which proves the substance is not a drug, not a volatile liquid, or not something the investigator suspected it to be.
- 09 = Reconstructive/Operability--where the laboratory examination demonstrates how an event could have happened; for example, how a gun could have been dropped and accidentally misfired.
- 10 = Inconclusive--where laboratory testing leads to no conclusive answer.
- 11 = Restorations/Decipherments/Reconstructions of Documents or Written Materials
- 12 = Serial Number Restoration
- 13 = No Prints Received by ID Unit
- 88 = Other (record)
- 99 = Unknown

435

Did the Laboratory Request that Additional Evidence/Standards be Collected?

66

- Enter 0 = Not Applicable
- 1 = Yes, and they were collected
- 2 = Yes, but they were not collected
- 3 = No
- 4 = Yes, but unknown if they were collected
- 9 = Unknown

6-438

What Value Were the Laboratory Results

67-72

LIST UP TO THREE IN ORDER OF IMPORTANCE

- Enter 00 = Not Applicable/not examined
 01 = No apparent value
 02 = Established an element of the crime (e.g. drugs, police think a crime was committed but need evidence to verify their suspicions)
 03 = Assisted in determining a crime was committed (e.g. suicide, police don't know whether a crime was committed or not)
 04 = Assisted in determining a crime was not committed
 05 = Reconstruction of the crime
 06 = Identified the victim
 07 = Identified the suspect/offender
 08 = Identified the instrument of the crime
 09 = Associated the suspect/offender with the crime scene
 10 = Associated the suspect/offender with the victim
 11 = Associated the suspect/offender with the instrument of the crime
 12 = Failed to associate the suspect/offender with the crime scene or victim
 13 = Associated the victim with the crime scene
 14 = Associated the instrument of the crime with the crime scene or victim
 15 = Confirmed the alibi of the suspect
 16 = Refuted the alibi of the suspect
 17 = Confirmed the statements of the victim or witness
 18 = Corroborated related case information
 19 = Refuted statements of the victim or witness
 20 = Developed useful modus operandi information
 21 = Information used to solve or clear other related crimes
 22 = Provided new leads to investigators
 88 = Other (record)
 99 = Unknown

39

Direct Police Action Taken as a Result of Receiving Information From the Laboratory

73-74

- Enter 00 = Not Applicable
 01 = None
 02 = Case unfounded
 03 = Warrant issued
 04 = Offender apprehended
 05 = Offender held/retained in custody
 06 = Offender released from custody
 07 = Person excluded as a suspect
 08 = Investigation suspended/closed
 09 = Investigation re-opened
 10 = Investigation re-directed
 11 = Other cases cleared
 88 = Other (record)
 99 = Unknown

440	Of What Significance Was the Physical Evidence in the Outcome of this Particular Investigation?	75
	Enter 0 = Not Applicable	
	1 = <u>No Significance</u> --the evidence played no role in either the solution or clearance of this case. Had this evidence not been collected or analyzed the outcome would have probably been the same.	
	2 = <u>Moderate Significance</u> --the physical evidence contributed information which was used in making one or more decisions in this particular case. Instances where the evidence corroborated an earlier decision or action by investigators would be included in this category.	
	3 = <u>High Significance</u> --the physical evidence played a crucial role in the outcome or resolution of this case. A decision guideline would be that case outcome would have been significantly altered or jeopardized had this evidence not been collected and examined.	
	8 = Other (record)	
	9 = Unknown	
441	How Long After its Collection Was the Evidence Received by the Laboratory?	76
442	How Long After Receipt by the Laboratory Was Request for Examination Made?	77
443	How Long After the Request for Examination Was a Laboratory Report Issued?	78
	Enter 0 = Not Applicable	
	1 = <u>Up to 1 day</u>	
	2 = <u>1+ to 7 days</u>	
	3 = <u>7+ to 30 days</u>	
	4 = <u>1+ to 2 months</u>	
	5 = <u>More than 2 months</u>	
	9 = Unknown	

END CARD FOUR (FIVE, SIX, SEVEN)

Recorder's Initials _____
 Police _____ Court _____ Case Complete _____

--	--	--	--

UTILIZATION OF FORENSIC SCIENCES: NO EVIDENCE CASES

<u>TABLE</u>	<u>INSTRUCTIONS</u>	<u>COL.</u>
100	City/Project Control Number	1
01	Incident Number	5
02	Offense Classification	13
103	Incident Code	15
104	Time of Report/Police Arrival--Day	
107	Time of Report/Police Arrival--Month/Date/Year	20-
08	Time of Report/Police Arrival--Hour	26-
109	Time Between Crime Committed and Crime Reported/Police Arrival	?
110	Crime Scene Location	29-
11	Premises Code	31-
2-114	Best Description of Offenders at Time of Police Response/E.T. Search	34-
5-117	Time Between Report/Arrival and Apprehension of Offenders	37-
18	Outcome of Investigation (Clearance Code)	40-
19	Time Between Report/Arrival and Clearance/Closure	41-
1-122	Dominant Investigative Techniques (List 3 in Order of Importance)	43-
123	Was Physical Evidence Collected	49
124	Why Was Physical Evidence <u>Not</u> Examined	50
125	Victim/Offender Relationship	51

Off #1 Name: _____ CB# _____ IR# _____ Branch: _____
 Off #2 Name: _____ CB# _____ IR# _____ Date: _____
 Off #3 Name: _____ CB# _____ IR# _____

INSTRUCTIONS

City/Project Control Number

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1-4
--------------------------	--------------------------	--------------------------	--------------------------	-----

	Def 1	Def 2	Def 3	
03 Initial Charge Against Defendant (Other Charges _____, _____, _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5-10
06 Final (amended) Charge Against Defendant (Other Charges _____, _____, _____)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11-16
09 Disposition of Final Charge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17-22
12 Sentence Imposed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	23-28
15 Minimum Length of Confinement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	29-34
18 Maximum Length of Confinement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	35-40
21 Month of Final Disposition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	41-46
24 Date of Final Disposition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	47-52
27 Year of Final Disposition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	53-58
30 Outcome of Appeal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	59-61

ORDER'S COMMENTS: Was there anything about this case which made it special or distinguishable from the others? Any other notes or comments?

APPENDIX B

APPREHENDING OFFENDERS: A DISCUSSION OF INVESTIGATIVE PRACTICES ASSOCIATED WITH FOLLOW-UP ARRESTS

Introduction

This brief chapter introduces a more extensive treatment of the relationship between information factors employed by the police and case outcome in chapters VI and VII. The focus of this particular appendix is on follow-up arrests which, by our definition, are arrests which take place more than 10 minutes after the crime was reported to the police/or 10 minutes after the arrival of the first officer at the scene. Removing these immediate apprehensions from the analysis enables us to focus on those steps within the control of the police which lead to suspect identifications and apprehensions. Immediate apprehensions are principally a function of how quickly the citizen discovers a crime and reports it to the police. For a recent, comprehensive treatment of this relationship, see Calling the Police (Spelman and Brown, 1982).

The primary purpose of this study is to examine the effects of physical evidence on criminal investigations; however, to develop a better understanding of the role of physical evidence it is helpful to understand the other types of information which investigators employ to solve cases. Because the objective of the appendix is to find out how apprehensions are made, two different types of data will be presented. In the first, after reading the case file and report narratives of crime

which resulted in an apprehension, coders were instructed to record the three key factors, in order of their occurrence, which led to the apprehension. See variables v219 to v221 on the coding instrument. The second approach was an examination of the various types of information collected in all physical evidence cases, regardless of case outcome, and to compute zero-order correlations between these various investigative factors and arrest outcome. This provides a second perspective on the utility of various information sources and strategies in so far as they are correlated with a follow-up (after 10 minutes) arrest.

Cases in the Physical Evidence Sample

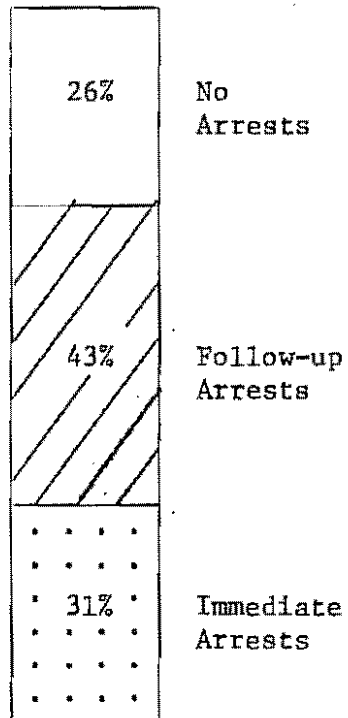
Figure B-1 illustrates the distribution of physical evidence cases in each of the study sites by arrest status. Initially, it can be seen that quite a high percentage of the cases sampled in Peoria (31%), Oakland (28%) and Chicago (27%) involved immediate arrests. Only 16% of the cases in Kansas City result in immediate apprehensions. The decision trees in Figure B-2, illustrate the fraction of all cases for each city which result in immediate and follow-up arrests. Of incidents not resulting in an immediate arrest, 72% of the cases in Oakland, 63% in Peoria, 48% in Chicago and 38% in Kansas City resulted in a follow-up arrest.

PHYSICAL EVIDENCE CASES IN THE STUDY SAMPLE

BY ARREST OUTCOME

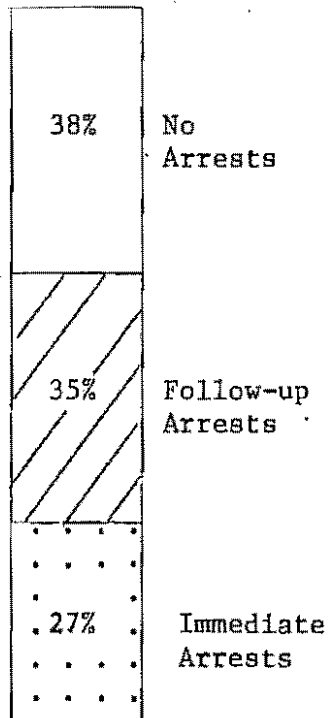
Peoria Cases

N = 318



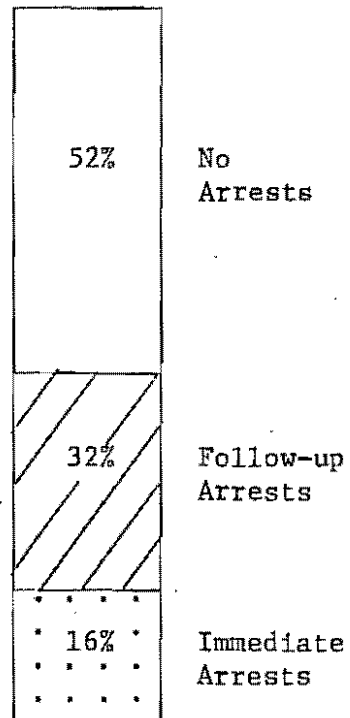
Chicago Cases

N = 399



Kansas City Cases

N = 358



Oakland Cases

N = 276

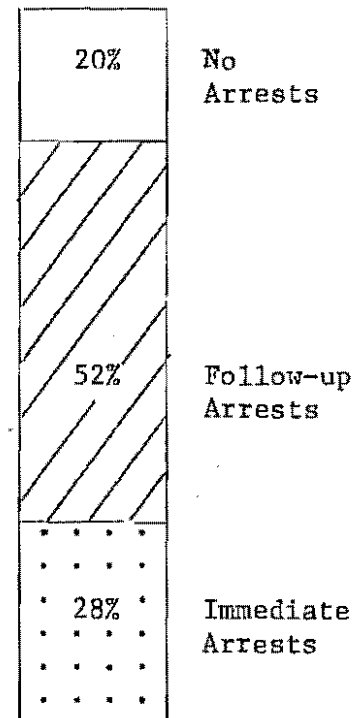
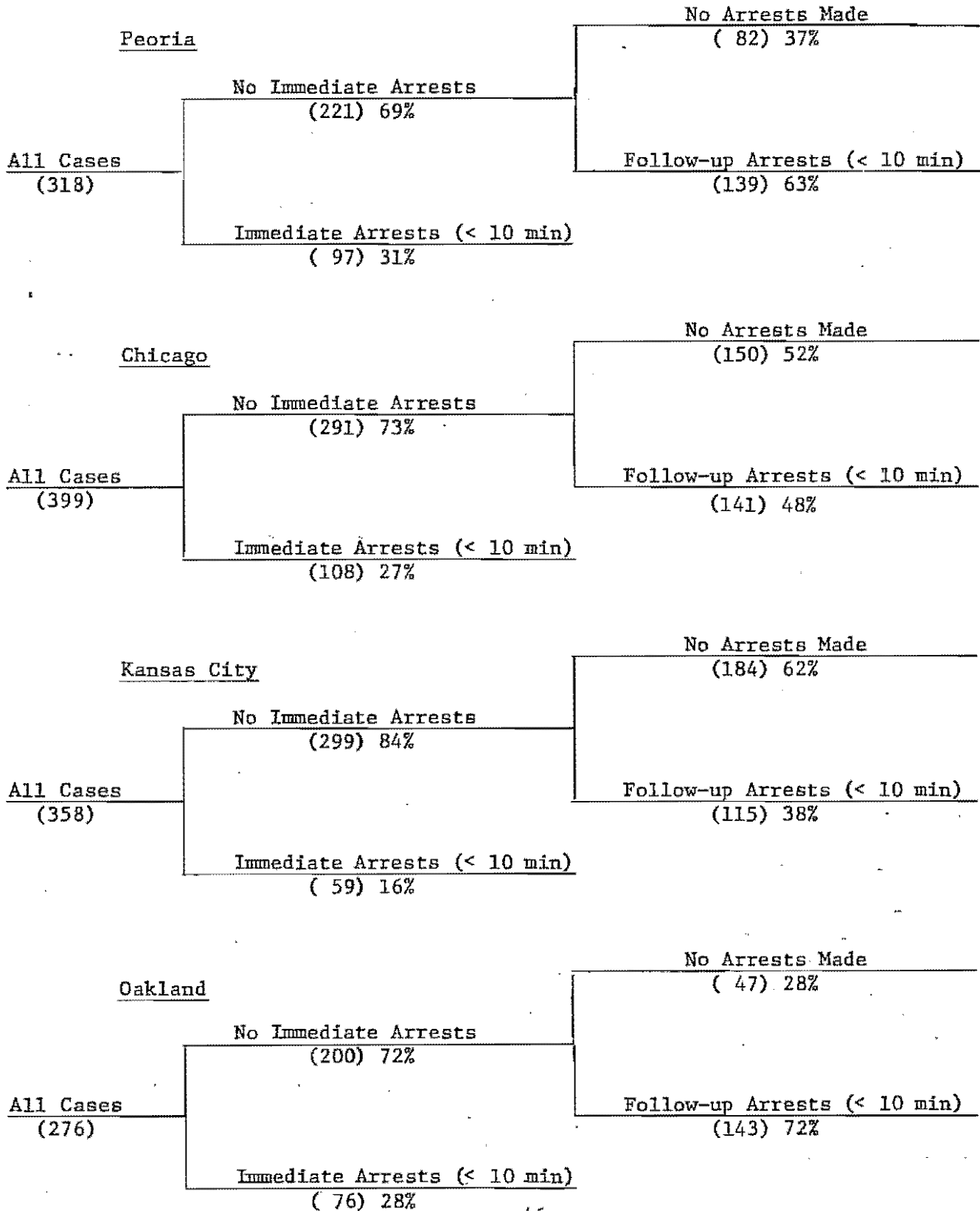


FIGURE B-2

ARREST STATUS AND OUTCOME OF
PHYSICAL EVIDENCE CASES IN ALL JURISDICTIONS



Factors Leading to Arrest

Tables B-1-5 summarize those information factors leading to the solution of cases in the study sample; for example, if a citizen spotted a suspect fleeing a neighbor's house, he called police supplying a description of the offender, and the police apprehended the suspect five blocks from the crime scene, the following factors would have been noted: citizen witnessed crime, description of suspect supplied and offender apprehended near scene of the crime.

Homicide

Citizens witnessing these crimes, the naming and placing of suspects, and confessions are the primary ways these crimes are cleared. The suspect surrendering to the police is a factor noted frequently in three of the four jurisdictions. In Peoria, physical evidence ranked as one of the top three factors in a third of the cases. One such case involved the murder of a night clerk at a local hotel. There were no witnesses and suspects, but the offender left behind fingerprints at the crime scene. These prints were searched against the police department files and resulted in a "cold hit," i.e., the prints were found to match the fingerprints of prior offender.

Sexual Assault

As in homicides, the crime being witnessed by a citizen and the naming and placing of a suspect are critical to the solution of these

To Borrow a Document: Complete one form for each document borrowed. keep the white copy with the document. Give the yellow copy to library staff.

NCJ # 97686

**NCJRS ONLINE RESEARCH AND
INFORMATION CENTER (ORIC)
LIBRARY LOAN FORM**

NAME: ED Zedlewski BUREAU NIJ

EMAIL: _____

TODAY'S DATE: 4/22/04

DUE DATE: 6/03/04

Return documents to ORIC. Remember to return the white copy with your document so we can clear your borrowing record. To renew documents, call 301-519-5063 or email ncjrs-library@ncjrs.org

TABLE B-1

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN THE CRIME OF
HOMICIDE

Peoria (N=18)*	Chicago (N=43)	Kansas City (N=24)	Oakland (N=32)
1. Physical Evidence (33%) **	1. Citizen Witnesses Crime (42%)	1. Suspect Confesses (50%)	1. Suspect Confesses (38%)
2. Citizen Witnesses Crime (28%)	2. Suspect Named and Placed (40%)	2. Suspect Named and Placed (25%)	2. Citizen Witnesses Crime (25%)
3. Suspect Appre Near Scene (22%)	3. Line-up (19%)	3. Suspect Surrenders (21%)	Informant (25%)
Suspect Named (22%)	4. Suspect Surrenders (16%)	4. Vehicle Description (17%)	4. Suspect Named (22%)
5. Suspect Surrenders (17%)	5. Suspect Named (14%)	5. Informant (17%)	Suspect Named and Placed (22%)
			Citizen Tip (22%)

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of solved cases in which this was one of the primary factors leading to an arrest

TABLE B-2

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN THE CRIME OF
SEXUAL ASSAULT

Peoria (N=25)*	Chicago (N=40)	Kansas City (N=24)	Oakland (N=47)
1. Suspect Named and Placed (40%) **	1. Suspect Named and Placed (40%)	1. Citizen Wit- nesses Crime (46%)	1. Suspect Named and Placed (47%)
2. Physical Evidence (28%)	2. Line-up (33%)	2. Line-up (38%)	2. Physical Evidence (43%)
3. Citizen Wit- nesses Crime (16%)	3. Suspect Appre Near Scene (20%)	3. Suspect Named and Placed (25%)	3. Suspect Appre Near Scene (30%)
Suspect Named (16%)	Vehicle Description (20%)	4. Suspect ID- Photos (21%)	4. Suspect Named (17%)
5. Suspect Appre Near Scene (12%)	5. Citizen Wit- nesses Crime (18%)	5. Gen Suspect Description (17%)	Suspect Confesses (17%)

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of cases in which this was one of the primary factors leading to an arrest

TABLE B-3

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN THE CRIME OF
ROBBERY

Peoria (N=7)*	Chicago (N=15)	Kansas City (N=23)	Oakland (N=25)
1. Vehicle Description (43%)**	1. Gen Suspect Description (33%)	1. Gen Suspect Description (39%)	1. Citizen Witnesses Crime (64%)
2. Gen Suspect Description (29%)	Citizen Witnesses Crime (33%)	Line-up (39%)	2. Vehicle Description (24%)
Suspect Appre Near Scene (29%)	3. Suspect Appre Near Scene (20%)	3. Suspect Arr Oth Crime (26%)	3. Gen Suspect Description (20%)
4. Six Factors All Mentioned Once	Line-up (20%)	4. Citizen Witnesses Crime (22%)	Suspect Arr Oth Crime (20%)
	5. Five Factors	ID-Photos (22%)	5. Suspect Appre Near Scene (16%)
			ID-Photos (16%)
			Physical Evidence (16%)

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of cases in which this was one of the primary factors leading to an arrest

TABLE B-4

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN THE CRIME OF
ASSAULT/BATTERY

Peoria (N=44) *	Chicago (N=20)	Kansas City (N=18)	Oakland (N=28)
1. Suspect Appre Near Scene (36%) **	1. Suspect Named and Placed (60%)	1. Citizen Wit- nesses Crime (50%)	1. Citizen Wit- nesses Crime (39%)
2. Suspect Named (30%)	2. Citizen Wit- nesses Crime (25%)	Suspect Named and Placed (50%)	2. Suspect Appre Near Scene (25%)
3. Citizen Wit- nesses Crime (25%)	3. Suspect Appre Near Scene (15%)	3. Victim Won't Cooperate (44%)	3. Police View Crime (18%)
4. Suspect Named and Placed (18%)	Gen Suspect Description (15%)	4. Suspect Appre Near Scene (17%)	Suspect Recog and Placed (18%)
5. Citizen Tip (11%)	Suspect Surrenders (15%)	Gen Suspect Description (17%)	Suspect Named (18%)
Vehicle Description (11%)			Physical Evidence (18%)

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of cases in which this was one of
the primary factors leading to an arrest

TABLE B-5

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN THE CRIME OF
BURGLARY/PROPERTY

Peoria (N=27) *	Chicago (N=24)	Kansas City (N=13)	Oakland (N=13)
1. Suspect Appre Near Scene (30%) **	1. Suspect Named (24%)	1. Suspect Confesses (77%)	1. Citizen Wit- nesses Crime (39%)
2. Citizen Wit- nesses Crime (22%)	Citizen Wit- nesses Crime (24%)	2. Vehicle Description (31%)	Suspect Appre Near Scene (39%)
3. Physical Evidence (15%)	Vehicle Description (24%)	3. Citizen Wit- nesses Crime (23%)	3. Vehicle Description (23%)
4. Vehicle Description (11%)	4. Suspect Named and Placed (19%)	Suspect Appre Near Scene (23%)	4. Gen Suspect Description (15%)
Citizen Tip (11%)	Suspect Confesses (19%)	Physical Evidence (23%)	Suspect Arr Oth Crime (15%)
		Warrant (23%)	

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of cases in which this was one of
the primary factors leading to an arrest

cases. Line-ups emerge as a important factor in two of the cities (Chicago and Kansas City), while physical evidence ranks high in Peoria and Oakland. Line-ups proved to be instrumental in solving rapes and other sexual offenses in Chicago and Kansas City. Apprehending the offender close to the crime scene ranked in the top five listings in three of the cities.

Robbery

Descriptions of offenders and vehicles rank high as factors contributing to follow-up case clearances in the different jurisdictions. The crime being observed by a citizen takes its usual high place, as does the offender being apprehended near the scene of the crime. Line-ups and the offender being arrested for another crime also emerge as important elements in investigations leading to a clearance. Physical evidence does not appear to be a leading factor in the follow-up clearance of robberies.

Assaults/Batteries

The clearance of assaults and batteries generally key upon witnesses, their ability to name a suspect and the police apprehending a suspect near the scene of the crime. Physical evidence does not rank as one of the top five factors in the clearance of assaults and batteries in any of the cities.

Burglaries

Only a small number of burglaries are solved, but of those which are cleared, witnesses, identification of a suspect and apprehensions near the scene of the crime rank high. Descriptions of vehicles also appear within the top five categories in all the study jurisdictions. Suspect confessions rank number one in Kansas City, as they do in homicides. Recovered stolen property, a category often cited as a major factor in burglary investigations, fails to appear as an important factor in the apprehension of suspects in any of the jurisdictions.

In summary, (see Table B-6 for a listing of top five factors across all offenses) the presence of citizens who witness the crime and the naming, placing and descriptions of suspects are clearly the most important factors leading to arrest. Apprehending offenders near the scene is, also, an important factor and this, too, depends upon information supplied by the citizens of a community. Physical evidence is found to be important in these follow-up clearances principally in two jurisdictions, Peoria and Oakland.

Correlating Information Factors and Arrest

Table B-7 lists a number of investigative variables. The information factors are classified in the following way:

TABLE B-6

INFORMATION FACTORS LEADING TO
FOLLOW-UP ARRESTS IN ALL CRIMES

Peoria (N=121)*	Chicago (N=142)*	Kansas City (N=145)	Oakland (N=145)
1. Suspect Appre Near Scene (30%) **	1. Suspect Named and Placed (39%)	1. Suspect Confesses (33%)	1. Citizen Wit- nesses Crime (30%)
2. Citizen Wit- nesses Crime (21%)	2. Citizen Wit- nesses Crime (29%)	2. Citizen Wit- nesses Crime (29%)	2. Gen Suspect Description (25%)
3. Suspect Named and Placed (19%)	3. Line-up (19%)	3. Gen Suspect Description (23%)	Suspect Appre Near Scene (25%)
Suspect Named (19%)	4. Suspect Appre Near Scene (17%)	4. Suspect Named and Placed (25%)	4. Physical Evidence (23%)
5. Physical Evidence (16%)	Gen Suspect Description (17%)	5. Line-up (19%)	Suspect Named and Placed (22%)

* The N refers to the number of offenses resulting in a follow-up arrest

** This value refers to the percent of cases in which this was one of the primary factors leading to an arrest

TABLE B-7

INVESTIGATION FACTORS/
INFORMATION SOURCES

Victim/Witness Dependent

Time from Discovery of Crime to
Police Report/Arrival

Witnesses

Victim/Suspect Relationship

Suspect Named and Placed

Vehicle/License Plate Descriptions

Police Response/Investigative Techniques

Detective Investigates

Evidence Technician Searches for Evidence

Detective/Supervisor at Crime Scene

Follow-up Interview of Victim/Witnesses

Canvass of Neighborhood

Record Search

Informant

Photos/Mugshots

Suspect Dependent Information

Suspect Interrogated

Line-up

Polygraph

TABLE B-7 continued

Physical Evidence Search/Collection

Two or more crime scenes searched

Scene and/or victim and suspect searched

Four or more evidence categories collected

Blood

Fingerprints

Firearms

Toolmarks

Glass/Plastics

Hair

Semen

Tracks/Impressions/Patterns

Victim/Witness Based Variables

This category of variables primarily depends upon victims and witnesses acting and/or supplying information to the police. Time elapsed between crime commission and its report to police (Peoria and Oakland) or arrival of police at the scene (Chicago and Kansas City), is largely a function of how quickly citizens react. The presence or absence of witnesses, their relationship (stranger/acquaintance) to the suspect, and the naming of a suspect are also functions of witnesses staying at the crime scene and relaying information to the police.

Police Responses/Investigative Techniques

These next variables summarize actions taken by the police in response to the crime. A decision by detectives to investigate, to conduct follow-up interviews, to canvass the neighborhood or to search police department records are all examples.

Suspect Dependent Information

The interrogation of suspects, use of a line-up or administration of a polygraph examination depend up the availability of a suspect, all of these actions, therefore, would be expected to have (and do have) a strong correlation with arrest.

Physical Evidence Search/Collection

The last category of variables addresses departmental efforts to search, collect and make use of physical evidence. The number of crime scenes searched, how much evidence was collected, and the identification of those evidence categories are all listed.

All of the variables were dichotomized (yes or no, presence or absence) as was the arrest variable. Zero order correlations were then computed for these variables and arrest. These correlations represent the strength of association among variables, but since they do not control for other variables, they must be viewed cautiously and only as a preliminary indication of association. Complete correlation matrices are included at the end of this Appendix classified by city and crime type. Those variables which have a significant association with follow-up arrest are discussed below, differentiated by crime type. Only those variables are included in this summary which were significant at least at the $p < .05$ level in two or more jurisdictions. The following key will be used in identifying the jurisdictions where the particular variable is associated with arrest:

Peoria = P.
Chicago = C.
Kansas City = K.C.
Oakland = O.

The strength of association is classified as follows:

* $p < .05$
** $p < .01$
*** $p < .001$

Homicide

Witnesses (P.***, C.**, O.*, K.C.**)

Suspect Identified (C.*, O.***)

Reinterview (P.*, C.*, O.**)

Photos/Mugshots (P.**, C.*, O.**)

Line-ups (P.*, O.*)

Blood (P.*, C.*, O.**)

Hair (P.**, C.*, O.*)

All of the above variables are associated with follow-up homicide arrests, $p < .05$ level or greater, in two or more of the study jurisdictions. As in the prior section, the presence of witnesses and suspect identifications emerge as significant factors. Reinterviews, which in the case of homicides key on the availability of witnesses (since the victim most often cannot be interviewed) are also significant. In the physical evidence category, collection of blood and hair are significantly correlated with homicide arrests in three jurisdictions.

Sexual Assaults

Victim Eyewitness Account (C.**, O.**)

Victim/Suspect Relationship (P.**, K.C.,*)

Line-ups (C.**, K.C.***)

Eyewitness accounts provided to police by victims of sexual assaults are significant in Chicago and Oakland. The victim being ac-

quainted with the suspect prior to the crime is significant in Peoria and Kansas City. Lineups prove to be highly correlated with arrest in Chicago and Kansas City. Hair and semen, the primary evidence categories collected in rape/sexual assaults, were only associated with follow-up arrests in a single jurisdiction each: hair in Kansas City and semen in Chicago.

Robbery

Number of Witnesses (C.***, K.C.* and O.*)

Lineups (C.***, K.C.*** and O.*)

Number of Crime Scenes Searched (P.*, K.C.*)

Witnesses and lineups prove to be the critical variables associated with arrest in the crime of robbery. The number of different scenes or locations searched for evidence proved to be associated with arrest in Peoria and Kansas City. Multiple scenes suggest that a vehicle might have been found to search, or a suspect's place of residence, both of which may prove useful in finding evidence to make an arrest.

Assault/Battery

Number of Witnesses (P.***, C.***, K.C.*)

Victim Eyewitness (P.***, C.*)

Suspect Identification (C.***, K.C.**)

Number of Crime Scenes Searched (P.*, O.**)

Blood (C.***, K.C.**)

The witness variables and suspect identifications proved to be the only non-physical evidence related variables associated with arrest in at least two jurisdictions. The number of crimes scenes searched and the collection of bloodstain evidence are associated with arrest in Chicago and Kansas City.

Burglary

Number of Witnesses (P.**. C.* and K.C.**)

Suspect Identification (C.***, K.C. *** and O**)

Vehicle/License Description (C.**, K.C.**)

Number of Crime Scenes Searched (P**, C.**, K.C.***)

Number of Evidence Categories (C.***, and O.*)

Number of witnesses and suspect identifications appear, again, as variables strongly associated without follow-up arrests. The description of a vehicle or license plate number is the third type of information which is dependent upon citizen cooperation which is significantly associated with arrest outcome. The number of crime scenes searched for evidence and the number of evidence categories collected are also associated with follow-up arrests in at least two of the cities.

Searching Suspects for Physical Evidence

There is also a highly significant association between searching a crime scene and/or victim plus a suspect for evidence and an arrest outcome. This situation represents the best possible searching oppor-

tunity, of course, since here the evidence gathered from the scene or victim can be readily compared with the evidence collected from a suspect. The strength of this association is not at all surprising since to search a suspect for evidence also means the police have a suspect within their control which, in and of itself, is highly associated with arrest and case solution.

The relationship between searching a suspect for evidence and making an arrest merits a closer look. All physical evidence cases in the sample were examined to determine the percent of time in which a suspect was actually searched for evidence. This might involve a blood sample from the suspect, his fingerprints, a hair sample, clothing or possibly his shoes. Those results are presented in Table B-8. Substantial differences are detectable from jurisdiction to jurisdiction. The percent of homicide and death related cases where suspects are searched for evidence range from a high of 65% of cases in Kansas City to a low of 27% of cases in Chicago. In robbery cases, Peoria ranks the highest (59%) while Kansas City ranks lowest (18%).

When the rates of follow-up arrests of cases where suspects are searched are compared with cases when suspects are not searched, the differences are significant, particularly in the crime categories of rape, robbery, assaults and battery and burglary. A high correlation here does not necessarily mean the evidence lead to the arrest, rather it is just as likely the search for evidence was incidental to the arrest. A better measure of the value of searching suspects for evidence is at the judicial level when cases reach the court level. This hypothesis is examined in Chapter VI.

TABLE B-8

PERCENT OF CASES WITH SUSPECTS WHERE THE
SUSPECT WAS SEARCHED AND EVIDENCE
SUBMITTED TO THE LABORATORY

Crime Category	Jurisdiction			
	Peoria	Chicago	Kansas City	Oakland
Death	61%	27%	65%	58%
Rape/Sex	62%	26%	49%	57%
Robbery	59%	36%	18%	64%
Assault	67%	28%	24%	60%
Burglary/ Property	69%	26%	40%	63%
Arson	-	5%	7%	-

Physical Evidence and Arrest

The previous analysis revealed that physical evidence was infrequently associated with follow-up arrests. This is not an unexpected result given the nature of the data base. All cases reviewed had at least one form of physical evidence collected and examined, and most contained at least two. Subsequently, when the outcome of cases with blood, for example, are compared with those without blood, many of these "other" cases also had some other form of physical evidence examined. This, therefore, is not a particularly good test of the value of the evidence.

Another way of looking at the effect of various evidence categories on arrest is to compare the cases where a particular evidence category was present against cases which had no physical evidence at all. This might give a better indication of the contribution of various evidence categories than this prior comparison.

While Chapter VI presents a much more detailed treatment of cases with and without evidence, the following table (B-9) briefly illustrates the differences in rates of follow-up arrests given the presence or absence of specific evidence categories. The data for the arrest outcomes in no-evidence cases are based on a sample of burglaries, assaults and burglaries in each jurisdiction where no physical evidence was collected. Those rates of arrest (no-evidence cases) are, therefore, constant in the comparison made within each jurisdiction. The rates of follow-up arrests in these no-evidence cases are then compared with the rates of follow-up arrests in cases where seven basic categories of evidence are either present or absent.

TABLE B-9

RATES OF FOLLOW-UP ARRESTS+ IN THE CRIME
CATEGORIES OF ROBBERY, ASSAULT AND BURGLARY
FOR CASES WITH AND WITHOUT PHYSICAL EVIDENCE COLLECTED

Evidence Category	Jurisdiction			
	Peoria	Chicago	Kansas City	Oakland
No-Evidence	10%	29%	20%	13%
Blood	67%***	54%**	47%**	87%***
Hair	67%***	#	78%***	#
Firearms	75%***	30%	46%***	71%***
Fingerprints	70%***	37%	38%***	70%***
Toolmarks	64%***	28%	29%	#
Glass	73%***	#	50%*	86%***
Tracks/Impressions/ Patterns	50%**	#	38%	#

+ Incidents where apprehension of a suspect occurred > 10 minutes from the time the crime was reported to/responded to by the police.

Arrest Rates where the frequency of an evidence category in these crime categories is < 5 are not computed.

* p < .05
** p < .01
*** p < .001

Summary

This appendix reviewed the utility of various information factors in explaining follow-up arrests (arrests occurring more than 10 minutes after the crime was reported to the public (Peoria) or the arrival of the first police officer at the scene (Chicago, Kansas City and Oakland). Examination of cases in the physical evidence sample showed the following:

- o A sizeable percentage (27% - 31%) of physical evidence cases in Peoria, Chicago, and Oakland ended in immediate apprehension. A substantially lower fraction (16%) of cases in Kansas City resulted in immediate apprehensions.
- o The presence of citizens who witnessed the crime, and the naming and placing of suspects by victims and witnesses are the most important factors leading to follow-up arrests. Suspect descriptions and information supplied by citizens enabling the police to apprehend suspects near the scene of the crime are also important.
- o Physical evidence is noted as a critical source of information in two of the cities (Peoria and Oakland) in terms of follow-up arrests.
- o Zero order correlations were also computed among investigative variables and follow-up arrests with much the same results.

Witnesses and suspect identification were consistently found to be highly correlated with arrest.

- o Lineups are significant in sexual assaults and robberies, and vehicle descriptions are significantly associated with arrest in burglaries.

- o Although individual physical evidence categories are seldomly correlated with follow-up arrests, the number of crime scenes searched and number of evidence categories collected are significant.

- o Cases (robberies, assaults, burglaries) with individual items of physical evidence are found to lead to arrest a significantly higher percentage of the time than cases with no evidence at all. Bloodstains, fingerprints, firearms and glass all have a significantly higher association with arrest in the cities, save for Chicago. In Chicago, the rates of arrest in crimes involving blood evidence are significantly higher than those without any evidence collected.

TABLE B-10
PEORIA CORRELATIONS

HOMICIDES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.1898 ⁺ (38) P=0.127	0.1252 (41) P=0.218	0.1795 (41) P=0.131	0.5346 (39) P=0.000	0.1209 (41) P=0.226	0.1448 (24) P=0.250
	V132	V204	V206	V207	V208	V209
ARREST**	0.3959 (18) P=0.052	0.3266 (40) P=0.020	0.0747 (41) P=0.219	0.2421 (41) P=0.064	0.7445 (41) P=0.000	0.5013 (41) P=0.000
	V210	V211	V213	V214	V223	V228
ARREST**	0.4551 (40) P=0.002	0.4213 (41) P=0.003	0.2191 (40) P=0.087	-0.1842 (41) P=0.124	0.6000 (40) P=0.000	0.4055 (41) P=0.004
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.3138 (41) P=0.023	0.2638 (41) P=0.048	-0.3517 (41) P=0.012	-0.1399 (41) P=0.192	0.2517 (41) P=0.056	0.4504 (41) P=0.002
	SEMEN**	TIP**				
ARREST**	0.0278 (41) P=0.431	0.3717 (41) P=0.008				

* CONSULT CODEBOOK IN TECHNICAL APPENDIX A-3 FOR DEFINITION OF VARIABLES USED.

** CREATED VARIABLES

+ EACH CELL MAY BE READ AS FOLLOWS:

0.1898 Pearson's r
(38) N of cases
P=0.127 One-tailed test of significance

TABLE B-10 CONTINUED
SEXUAL ASSAULTS

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.4854 (42) P=0.001	-0.0886 (44) P=0.284	0.1373 (44) P=0.187	0.0321 (44) P=0.418	99.0000 (44) P=*****	0.5144 (42) P=0.000
	V132	V204	V206	V207	V208	V209
ARREST**	0.3922 (42) P=0.005	0.0509 (44) P=0.371	99.0000 (44) P=*****	-0.2379 (44) P=0.060	0.6616 (44) P=0.000	0.1709 (44) P=0.134
	V210	V211	V213	V214	V223	V228
ARREST**	-0.2310 (44) P=0.066	-0.1100 (44) P=0.239	0.1732 (44) P=0.131	-0.0269 (44) P=0.431	0.3811 (44) P=0.005	-0.0621 (44) P=0.344
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	-0.0321 (44) P=0.418	0.0269 (44) P=0.431	0.1210 (44) P=0.217	-0.0509 (44) P=0.371	99.0000 (44) P=*****	-0.0886 (44) P=0.284
	SEMEN**	TIP**				
ARREST**	-0.1709 (44) P=0.134	-0.1922 (44) P=0.106				

TABLE B-10 CONTINUED
ROBBERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.2673 (13) P=0.189	99.0000 (13) P=*****	-0.0976 (13) P=0.376	-0.0976 (13) P=0.376	99.0000 (13) P=*****	-0.0329 (13) P=0.458
	V132	V204	V206	V207	V208	V209
ARREST**	99.0000 (12) P=*****	99.0000 (13) P=*****	-0.0329 (13) P=0.458	-0.2254 (13) P=0.230	1.0000 (13) P=0.0	-0.0329 (13) P=0.458
	V210	V211	V213	V214	V223	V228
ARREST**	0.3948 (13) P=0.091	0.3948 (13) P=0.091	-0.0514 (13) P=0.434	0.2673 (13) P=0.189	0.7319 (13) P=0.002	0.3948 (13) P=0.091
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.0976 (13) P=0.376	0.1409 (13) P=0.323	0.4148 (13) P=0.079	99.0000 (13) P=*****	0.2673 (13) P=0.189	-0.0329 (13) P=0.458
	SEMEN**	TIP**				
ARREST**	99.0000 (13) P=*****	99.0000 (13) P=*****				

TABLE B-10 CONTINUED
ASSAULTS/BATTERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.3565 (56) P=0.003	-0.0454 (58) P=0.367	0.0418 (58) P=0.378	0.5769 (57) P=0.000	0.4259 (58) P=0.000	0.1869 (54) P=0.088
	V132	V204	V206	V207	V208	V209
ARREST**	0.2361 (49) P=0.051	0.0730 (58) P=0.293	0.0747 (58) P=0.289	0.0400 (57) P=0.384	0.3974 (56) P=0.001	-0.1142 (58) P=0.197
	V210	V211	V213	V214	V223	V228
ARREST**	0.0297 (58) P=0.412	0.1066 (58) P=0.213	0.0853 (58) P=0.262	0.0133 (58) P=0.460	0.2668 (57) P=0.022	-0.2053 (58) P=0.061
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	-0.1927 (58) P=0.074	-0.0354 (58) P=0.396	0.1679 (58) P=0.104	99.0000 (58) P=*****	0.0747 (58) P=0.289	-0.0502 (58) P=0.354
	SEMEN**	TIP**				
ARREST**	0.0747 (58) P=0.289	0.1066 (58) P=0.213				

TABLE B-10 CONTINUED
BURGLARIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.0426 (43) P=0.393	0.0437 (44) P=0.389	0.0804 (44) P=0.302	0.3563 (44) P=0.009	0.1627 (44) P=0.146	0.2546 (37) P=0.064
	V132	V204	V206	V207	V208	V209
ARREST**	0.1540 (26) P=0.226	0.2266 (43) P=0.072	99.0000 (43) P=*****	-0.1091 (44) P=0.240	0.5733 (40) P=0.000	0.1700 (43) P=0.138
	V210	V211	V213	V214	V223	V228
ARREST**	0.1700 (43) P=0.138	99.0000 (43) P=*****	0.1711 (43) P=0.136	0.1188 (43) P=0.224	0.3943 (43) P=0.004	0.1650 (44) P=0.142
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.1627 (44) P=0.146	0.0753 (44) P=0.314	-0.1091 (44) P=0.240	0.0092 (44) P=0.476	0.0753 (44) P=0.314	0.1153 (44) P=0.228
	SEMEN**	TIP**				
ARREST**	99.0000 (44) P=*****	-0.2540 (44) P=0.048				

TABLE B-11
CHICAGO CORRELATIONS

HOMICIDES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.0260 ⁺ (57) P=0.424	0.0345 (64) P=0.393	0.2238 (64) P=0.038	0.3143 (64) P=0.006	0.2107 (64) P=0.0476	0.2584 (59) P=0.024
	V132	V204	V206	V207	V208	V209
ARREST**	0.1139 (41) P=0.239	0.2482 (64) P=0.024	0.1035 (64) P=0.208	-0.0274 (64) P=0.415	0.5628 (63) P=0.000	-0.0249 (64) P=0.423
	V210	V211	V213	V214	V223	V228
ARREST**	0.2332 (64) P=0.032	0.2019 (64) P=0.055	0.0383 (64) P=0.382	-0.1058 (64) P=0.203	-0.0139 (63) P=0.457	0.1248 (64) P=0.163
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.2807 (64) P=0.012	-0.0021 (64) P=0.494	-0.2468 (64) P=0.025	0.1300 (64) P=0.153	0.1300 (64) P=0.153	0.2328 (64) P=0.032
	SEMEN**	TIP**				
ARREST**	99.0000 (41) P=*****	0.1605 (41) P=0.103				

* CONSULT CODEBOOK IN TECHNICAL APPENDIX A-3 FOR DEFINITION OF VARIABLES USED.

** CREATED VARIABLES

+ EACH CELL MAY BE READ AS FOLLOWS:

-0.0260 Pearson's r
(57) N of cases
P=0.424 One-tailed test of significance

TABLE B-11 CONTINUED
SEXUAL ASSAULTS

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.0434 (45) P=0.389	-0.0533 (45) P=0.364	-0.1000 (45) P=0.257	0.1517 (45) P=0.160	0.4264 (45) P=0.002	0.1591 (45) P=0.148
	V132	V204	V206	V207	V208	V209
ARREST**	0.2325 (40) P=0.074	-0.0533 (45) P=0.364	0.0533 (45) P=0.364	0.0189 (45) P=0.451	0.5818 (43) P=0.000	99.0000 (45) P=*****
	V210	V211	V213	V214	V223	V228
ARREST**	-0.1512 (45) P=0.161	0.3780 (45) P=0.005	0.1557 (44) P=0.156	0.2385 (45) P=0.057	0.0533 (45) P=0.364	0.1890 (45) P=0.107
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.1000 (45) P=0.257	-0.0693 (45) P=0.325	0.0762 (45) P=0.309	99.0000 (45) P=*****	99.0000 (45) P=*****	0.0849 (45) P=0.290
	SEMEN**	TIP**				
ARREST**	0.5500 (45) P=0.000	0.0533 (45) P=0.364				

TABLE B-11 CONTINUED
ROBBERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.3162 (26) P=0.058	0.2035 (27) P=0.154	0.0284 (27) P=0.444	0.3315 (27) P=0.046	0.2035 (27) P=0.154	0.1048 (27) P=0.301
	V132	V204	V206	V207	V208	V209
ARREST**	0.0400 (21) P=0.432	0.3669 (27) P=0.030	0.2726 (27) P=0.085	-0.1160 (27) P=0.282	0.7802 (27) P=0.000	-0.2935 (27) P=0.069
	V210	V211	V213	V214	V223	V228
ARREST**	0.1251 (27) P=0.267	0.6253 (27) P=0.000	0.2686 (27) P=0.088	0.1932 (27) P=0.167	0.2673 (26) P=0.093	0.2726 (27) P=0.085
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.1868 (27) P=0.175	0.2686 (27) P=0.088	0.0447 (27) P=0.412	0.1890 (27) P=0.173	99.0000 (27) P=*****	0.1890 (27) P=0.173
	SEMEN**	TIP**				
ARREST**	0.2726 (27) P=0.085	99.0000 (27) P=*****				

TABLE B-11 CONTINUED
ASSAULTS/BATTERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.0367 (40) P=0.411	0.2023 (41) P=0.102	0.1020 (41) P=0.263	0.4783 (41) P=0.001	0.2911 (41) P=0.032	0.7142 (38) P=0.000
	V132	V204	V206	V207	V208	V209
ARREST**	0.2222 (21) P=0.166	0.2981 (41) P=0.029	0.2196 (41) P=0.084	0.1384 (41) P=0.194	0.6054 (40) P=0.000	99.0000 (41) P=*****
	V210	V211	V213	V214	V223	V228
ARREST**	0.0757 (41) P=0.319	0.2196 (41) P=0.084	0.3145 (41) P=0.023	0.1020 (41) P=0.263	0.2168 (39) P=0.092	0.1099 (41) P=0.247
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.5209 (41) P=0.000	0.3604 (41) P=0.010	-0.2928 (41) P=0.032	99.0000 (41) P=*****	0.2196 (41) P=0.084	-0.2196 (41) P=0.084
	SEMEN**	TIP**				
ARREST**	99.0000 (41) P=*****	99.0000 (41) P=*****				

TABLE B-11 CONTINUED
BURGLARIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.0241 (59) P=0.428	0.1008 (64) P=0.214	0.0589 (64) P=0.322	0.2692 (64) P=0.016	0.0035 (64) P=0.489	0.7283 (64) P=0.000
	V132	V204	V206	V207	V208	V209
ARREST**	0.0400 (21) P=0.432	-0.0499 (64) P=0.348	99.0000 (64) P=*****	-0.0531 (64) P=0.338	0.7069 (63) P=0.000	-0.0788 (64) P=0.268
	V210	V211	V213	V214	V223	V228
ARREST**	0.2014 (64) P=0.055	0.2871 (64) P=0.011	0.3051 (64) P=0.007	0.2014 (64) P=0.055	0.3062 (58) P=0.010	0.4128 (64) P=0.000
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.0297 (64) P=0.408	-0.1968 (64) P=0.060	-0.0334 (64) P=0.397	-0.0538 (64) P=0.336	-0.1387 (64) P=0.137	0.2014 (64) P=0.055
	SEMEN**	TIP**				
ARREST**	99.0000 (64) P=*****	0.0257 (64) P=0.420				

TABLE B-12
KANSAS CITY CORRELATIONS

HOMICIDES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.1524 † (32) P=0.202	99.0000 (35) P=*****	0.0369 (35) P=0.417	0.4212 (35) P=0.006	99.0000 (35) P=*****	0.1195 (34) P=0.250
	V132	V204	V206	V207	V208	V209
ARREST**	-0.1287 (25) P=0.270	0.2089 (35) P=0.114	-0.1830 (35) P=0.146	-0.0602 (35) P=0.366	0.4669 (35) P=0.002	-0.5908 (35) P=0.000
	V210	V211	V213	V214	V223	V228
ARREST**	-0.0246 (35) P=0.444	0.1239 (35) P=0.239	0.0091 (35) P=0.479	0.0998 (35) P=0.284	0.0983 (35) P=0.287	-0.1239 (35) P=0.239
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.1189 (35) P=0.248	-0.1778 (35) P=0.153	-0.2297 (35) P=0.092	-0.0491 (35) P=0.390	0.0061 (35) P=0.486	-0.0091 (35) P=0.479
	SEMEN**	TIP**				
ARREST**	-0.0815 (35) P=0.321	-0.1506 (35) P=0.194				

* CONSULT CODEBOOK IN TECHNICAL APPENDIX A-3 FOR DEFINITION OF VARIABLES USED.

** CREATED VARIABLES

† EACH CELL MAY BE READ AS FOLLOWS:

0.1524 Pearson's r
(32) N of cases
P=0.202 One-tailed test of significance

TABLE B-12 CONTINUED
SEXUAL ASSAULTS

	V110*	DETECT**	DETSCE**	V123	V124	V125
ARREST**	0.0289 (44) P=0.426	0.1671 (44) P=0.139	0.1826 (44) P=0.118	0.0594 (44) P=0.351	99.0000 (44) P=*****	0.2366 (44) P=0.061
	V132	V204	V206	V207	V208	V209
ARREST**	0.3070 (43) P=0.023	99.0000 (44) P=*****	0.0658 (44) P=0.336	-0.0833 (44) P=0.295	0.8216 (44) P=0.000	0.1830 (44) P=0.117
	V210	V211	V213	V214	V223	V228
ARREST**	0.0415 (44) P=0.394	0.4639 (44) P=0.001	0.0392 (44) P=0.400	0.0363 (44) P=0.408	0.1381 (44) P=0.189	0.4852 (44) P=0.000
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.3545 (44) P=0.009	0.1329 (44) P=0.195	99.0000 (44) P=*****	-0.0199 (44) P=0.449	99.0000 (44) P=*****	-0.4423 (44) P=0.001
	SEMEN**	TIP**				
ARREST**	0.1029 (44) P=0.253	0.2297 (44) P=0.067				

TABLE B-12 CONTINUED
ROBBERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.1229 (52) P=0.193	99.0000 (54) P=*****	-0.0447 (54) P=0.374	0.2443 (54) P=0.037	99.0000 (54) P=*****	0.2935 (54) P=0.016
	V132	V204	V206	V207	V208	V209
ARREST**	0.2060 (51) P=0.073	99.0000 (54) P=*****	0.2035 (54) P=0.070	-0.1605 (54) P=0.123	0.7646 (54) P=0.000	0.2517 (54) P=0.033
	V210	V211	V213	V214	V223	V228
ARREST**	0.1052 (54) P=0.225	0.6094 (54) P=0.000	0.1568 (54) P=0.129	-0.0719 (54) P=0.303	0.2652 (54) P=0.026	0.0240 (54) P=0.431
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	-0.1932 (54) P=0.081	-0.0648 (54) P=0.321	0.1448 (54) P=0.148	0.0899 (54) P=0.259	-0.1324 (54) P=0.170	0.2902 (54) P=0.017
	SEMEN**	TIP**				
ARREST**	99.0000 (54) P=*****	-0.2615 (54) P=0.028				

TABLE B-12 CONTINUED
ASSAULTS/BATTERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.0325 (32) P=0.430	0.0325 (32) P=0.430	0.1741 (32) P=0.170	0.3578 (32) P=0.022	0.1491 (32) P=0.208	0.4526 (32) P=0.005
	V132	V204	V206	V207	V208	V209
ARREST**	0.3303 (21) P=0.072	0.2000 (32) P=0.136	99.0000 (32) P=*****	-0.2000 (32) P=0.136	0.5204 (32) P=0.001	0.0667 (32) P=0.358
	V210	V211	V213	V214	V223	V228
ARREST**	0.2928 (32) P=0.052	0.0667 (32) P=0.358	0.0667 (32) P=0.358	-0.0976 (32) P=0.298	-0.2000 (32) P=0.136	0.4152 (32) P=0.009
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.4152 (32) P=0.009	0.0222 (32) P=0.452	0.1391 (32) P=0.224	99.0000 (32) P=*****	99.0000 (32) P=*****	99.0000 (32) P=*****
	SEMEN**	TIP**				
ARREST**	99.0000 (32) P=*****	0.2319 (32) P=0.101				

TABLE B-12 CONTINUED
BURGLARIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.2913 (42) P=0.031	0.3003 (43) P=0.025	0.0366 (43) P=0.408	0.4094 (43) P=0.003	0.2770 (43) P=0.036	0.4932 (42) P=0.000
	V132	V204	V206	V207	V208	V209
ARREST**	0.3371 (13) P=0.130	0.2833 (43) P=0.033	-0.2004 (43) P=0.099	0.5060 (43) P=0.000	0.9508 (43) P=0.000	0.3108 (43) P=0.025
	V210	V211	V213	V214	V223	V228
ARREST**	0.2108 (43) P=0.087	0.0701 (43) P=0.328	0.3742 (43) P=0.007	-0.1129 (43) P=0.235	0.6325 (43) P=0.000	0.1557 (43) P=0.159
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.1516 (43) P=0.166	-0.2901 (43) P=0.030	99.0000 (43) P=*****	-0.2055 (43) P=0.093	0.2232 (43) P=0.075	0.0701 (43) P=0.328
	SEMEN**	TIP**				
ARREST**	99.0000 (43) P=*****	0.1516 (43) P=0.166				

TABLE B-13
OAKLAND CORRELATIONS

HOMICIDES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.2245 ⁺ (53) P=0.053	0.0137 (56) P=0.460	0.1205 (56) P=0.188	0.3024 (46) P=0.021	0.1126 (56) P=0.204	0.4230 (56) P=0.001
	V132	V204	V206	V207	V208	V209
ARREST**	0.2128 (37) P=0.103	0.3689 (56) P=0.003	-0.0616 (56) P=0.326	0.1778 (56) P=0.095	0.8266 (46) P=0.000	-0.1227 (52) P=0.193
	V210	V211	V213	V214	V223	V228
ARREST**	0.3436 (54) P=0.005	0.2649 (54) P=0.026	-0.0137 (56) P=0.460	0.4472 (54) P=0.000	0.1816 (56) P=0.094	0.0349 (56) P=0.399
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.3147 (56) P=0.009	0.0741 (56) P=0.294	0.0210 (56) P=0.439	99.0000 (56) P=*****	0.1126 (56) P=0.204	-0.2287 (56) P=0.045
	SEMEN**	TIP**				
ARREST**	-0.2850 (56) P=0.017	-0.0349 (56) P=0.399				

* CONSULT CODEBOOK IN TECHNICAL APPENDIX A-3 FOR DEFINITION OF VARIABLES USED.

** CREATED VARIABLES

+ EACH CELL MAY BE READ AS FOLLOWS:

-0.2245 Pearson's r
(53) N of cases
P=0.053 One-tailed test of significance

TABLE B-13 CONTINUED
SEXUAL ASSAULTS

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.0911 (49) P=0.267	0.0119 (51) P=0.467	0.1121 (51) P=0.217	-0.2125 (50) P=0.069	0.3788 (51) P=0.003	0.0533 (51) P=0.355
	V132	V204	V206	V207	V208	V209
ARREST**	0.0714 (51) P=0.309	-0.0738 (51) P=0.303	-0.3168 (51) P=0.012	-0.2731 (51) P=0.026	0.2691 (47) P=0.034	0.0286 (51) P=0.421
	V210	V211	V213	V214	V223	V228
ARREST**	-0.0622 (51) P=0.332	0.0935 (51) P=0.257	0.0666 (51) P=0.321	-0.0786 (39) P=0.317	-0.1380 (50) P=0.170	0.1397 (51) P=0.164
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	-0.1059 (51) P=0.230	0.1182 (51) P=0.204	0.0408 (51) P=0.388	99.0000 (51) P=*****	99.0000 (51) P=*****	0.0714 (51) P=0.309
	SEMEN**	TIP**				
ARREST**	0.1715 (51) P=0.114	0.0505 (51) P=0.362				

TABLE B-13 CONTINUED
ROBBERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.2106 (30) P=0.132	0.0 (30) P=0.500	-0.1826 (30) P=0.167	0.3508 (30) P=0.029	-0.1195 (30) P=0.265	0.1754 (30) P=0.177
	V132	V204	V206	V207	V208	V209
ARREST**	0.0897 (28) P=0.325	99.0000 (30) P=*****	0.3311 (29) P=0.040	-0.1268 (29) P=0.256	0.6124 (25) P=0.001	99.0000 (27) P=*****
	V210	V211	V213	V214	V223	V228
ARREST**	-0.0885 (28) P=0.327	0.3656 (27) P=0.030	0.0352 (30) P=0.427	0.1826 (29) P=0.172	-0.1131 (27) P=0.287	0.2106 (30) P=0.132
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.0976 (30) P=0.304	-0.0894 (30) P=0.319	-0.1826 (30) P=0.167	99.0000 (30) P=*****	99.0000 (30) P=*****	99.0000 (30) P=*****
	SEMEN**	TIP**				
ARREST**	0.0830 (30) P=0.331	-0.2390 (30) P=0.102				

TABLE B-13 CONTINUED
ASSAULTS/BATTERIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	0.1641 (34) P=0.177	0.2244 (35) P=0.098	0.1936 (35) P=0.133	0.2158 (35) P=0.107	-0.0284 (35) P=0.436	0.1291 (35) P=0.230
	V132	V204	V206	V207	V208	V209
ARREST**	0.1586 (33) P=0.189	0.0246 (34) P=0.445	0.1085 (35) P=0.268	0.3721 (35) P=0.014	0.2913 (33) P=0.050	0.1085 (35) P=0.268
	V210	V211	V213	V214	V223	V228
ARREST**	0.1200 (35) P=0.246	99.0000 (35) P=*****	0.1199 (35) P=0.246	0.2600 (35) P=0.066	0.4862 (35) P=0.002	0.1557 (35) P=0.186
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.0827 (35) P=0.318	0.1581 (35) P=0.182	-0.1581 (35) P=0.182	99.0000 (35) P=*****	-0.2712 (35) P=0.058	99.0000 (35) P=*****
	SEMEN**	TIP**				
ARREST**	99.0000 (35) P=*****	99.0000 (35) P=*****				

TABLE B-13 CONTINUED
BURGLARIES

	V110*	DETECT**	DETSCENE**	V123	V124	V125
ARREST**	-0.2390 (24) P=0.130	99.0000 (25) P=*****	99.0000 (25) P=*****	-0.0891 (25) P=0.336	0.1336 (25) P=0.262	0.4830 (23) P=0.010
	V132	V204	V206	V207	V208	V209
ARREST**	0.0833 (13) P=0.393	-0.3651 (24) P=0.040	0.1615 (24) P=0.225	-0.0710 (24) P=0.371	0.2066 (23) P=0.172	99.0000 (24) P=*****
	V210	V211	V213	V214	V223	V228
ARREST**	0.0325 (24) P=0.440	99.0000 (24) P=*****	0.0325 (24) P=0.440	99.0000 (24) P=*****	0.1336 (25) P=0.262	0.3563 (25) P=0.040
	BLOOD**	PRINTS**	FARMS**	TOOLS**	GLASS**	HAIR**
ARREST**	0.4082 (25) P=0.021	-0.1667 (25) P=0.213	0.0503 (25) P=0.406	0.1336 (25) P=0.262	0.4588 (25) P=0.011	99.0000 (25) P=*****
	SEMEN**	TIP**				
ARREST**	99.0000 (25) P=*****	-0.0602 (25) P=0.388				

APPENDIX C

TABLE C-2

CLEARANCE RATES FOR EVIDENCE AND NO-EVIDENCE CASES
(Chi Square Values)

Crime	Sample	Clearance Rates			
		Peoria	Chicago	Kan City	Oakland
Robbery	Evidence	12.416 ***	0.153	5.229 *	49.920 ***
	No-Evidence				
Assault/Battery	Evidence	13.174 ***	2.608	0.029	3.073
	No-Evidence				
Burglary/Property	Evidence	66.780 ***	0.360	27.424 ***	31.119 ***
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

TABLE C-3

POLICE KNOWLEDGE OF SUSPECTS AT OUTSET OF INVESTIGATION
(Chi Square Values)

Crime	Sample	Suspect 'In Custody' or 'Named & Placed'			
		Peoria	Chicago	Kan City	Oakland
Robbery	Evidence	3.613	1.719	0.223	4.739 ***
	No-Evidence				
Assault/Battery	Evidence	0.063	8.174 **	0.115	1.740
	No-Evidence				
Burglary/Theft	Evidence	37.768 ***	0.016	11.123 ***	15.898 ***
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

TABLE C-4

TIME ELAPSED FROM DISCOVERY OF CRIME TO REPORT TO
POLICE/POLICE RESPONSE

(Chi Square Values)

Crime	Sample	Time Elapsed 10 Minutes or Less			
		Peoria	Chicago	Kan City	Oakland
	Evidence				
Robbery		5.701 *	2.473	6.134 *	8.218 **
	No-Evidence				
	Evidence				
Assault/Battery		12.850 ***	1.554	5.187 *	17.307 ***
	No-Evidence				
	Evidence				
Burglary/Property		20.657 ***	1.578	3.447	8.546 **
	No-Evidence				

Chi Square Significance: * p < .05
** p < .01
*** p < .001

TABLE C-5

WITNESS INFORMATION PROVIDED TO POLICE AT OUTSET OF INVESTIGATION
(Chi Square Values)

Crime	Sample	Witness Information Provided			
		Peoria	Chicago	Kan City	Oakland
	Evidence				
Robbery		0.015	1.109	0.034	0.011
	No-Evidence				
	Evidence				
Assault/Battery		0.478	0.038	0.113	1.756
	No-Evidence				
	Evidence				
Burglary/Property		33.623 ***	0.949	20.189 ***	10.474 **
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

TABLE C-6

CLEARANCE RATES CONTROLLING FOR
POLICE KNOWLEDGE OF SUSPECTS AT OUTSET OF INVESTIGATION
(Chi Square Values)

Crime	In Custody or Named & Placed	Sample	Clearance Rates			
			Peoria	Chicago	Kan City	Oakland
Robbery	Yes	Evidence	0.326	0.013	--	0.502
		No-Evidence				
	No	Evidence	10.995 ***	0.004	5.548 *	48.582 ***
		No-Evidence				
Assault/ Battery	Yes	Evidence	6.945 **	7.468 **	0.220	3.574
		No-Evidence				
	No	Evidence	7.079 **	3.687	0.039	1.703
		No-Evidence				
Burglary/ Property	Yes	Evidence	8.601 **	0.444	0.058	0.010
		No-Evidence				
	No	Evidence	39.562 ***	0.012	19.991 ***	21.446 ***
		No-Evidence				

Chi Sq Sig: -- N too small * p < .05; ** p < .01; *** p < .001

TABLE C-7

CLEARANCE RATES CONTROLLING FOR TIME ELAPSED
FROM CRIME DISCOVERY TO REPORT TO RESPONSE BY THE POLICE*
(Chi Square Values)

Crime	Time Elapsed 10 Minutes Or Less	Sample	Clearance Rates			
			Peoria	Chicago	Kan City	Oakland
	Yes	Evidence	6.353	0.058	5.209	16.406
			*		*	***
	No-Evidence					
	Robbery	No	Evidence	3.129	0.296	0.532

	Yes	No-Evidence				
		Evidence	1.362	2.393	0.075	0.069
Assault/ Battery	No	No-Evidence				
		Evidence	3.747	0.103	0.010	3.651
	Yes	No-Evidence				
		Evidence	27.445	0.026	13.479	6.891
			***	***	**	
Burglary/ Property	No	No-Evidence				
		Evidence	22.476	3.728	4.613	10.849
	Yes	No-Evidence				
		Evidence			*	***

Chi Sq Sig: -- N too small * p < .05; ** p < .01; *** p < .001

TABLE C-8

CLEARANCE RATES CONTROLLING FOR WITNESS
 INFORMATION PROVIDED TO POLICE AT OUTSET OF INVESTIGATION
 (Chi Square Values)

Crime	Witness Information Provided	Sample	Clearance Rates			
			Peoria	Chicago	Kan City	Oakland
Robbery	Yes	Evidence	10.902 ***	0.217	5.685 *	48.733 ***
		No-Evidence				
	No	Evidence	--	--	--	--
		No-Evidence				
Assault/ Battery	Yes	Evidence	13.195 ***	2.197	0.567	6.188 *
		No-Evidence				
	No	Evidence	--	--	--	--
		No-Evidence				
Burglary/ Property	Yes	Evidence	28.084 ***	0.044	0.881	17.181 ***
		No-Evidence				
	No	Evidence	8.752 **	0.002	8.859 **	12.870 ***
		No-Evidence				

Chi Sq Sig: -- N too small * p < .05; ** p < .01; *** p < .001

TABLE C-9

PERCENT OF ARRESTS LEADING TO FORMAL CHARGES BEING FILED FOR
EVIDENCE AND NO-EVIDENCE CASES.

(Chi Square Values)

Crime	Sample	Charging Rates			
		Peoria	Chicago	K. C.	Oakland
Robbery	Evidence	1.143	3.819	29.000 ***	0.001
	No-Evidence				
Assault/Battery	Evidence	0.001	0.265	2.597	4.253 *
	No-Evidence				
Burglary/Property	Evidence	3.948 *	1.414	3.376	6.172 *
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

TABLE C-10
 PERCENT OF ARRESTS LEADING TO CONVICTIONS
 EVIDENCE AND NO-EVIDENCE CASES

(N of Arrests)

Crime	Sample	Conviction Rates			
		Peoria	Chicago	Kan City	Oakland
Robbery	Evidence	1.481	0.479	13.877 ***	2.277
	No-Evidence				
Assault/Battery	Evidence	0.075	0.040	0.266	0.037
	No-Evidence				
Burglary/Property	Evidence	0.537	2.540	4.183 *	0.239
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

TABLE C-11

PERCENT OF INCIDENTS RESULTING IN AT LEAST ONE CONVICTION

(Chi Square Values)

Crime	Sample	Conviction Rates (Incidents Leading to a Conviction)			
		Peoria	Chicago	Kan City	Oakland
Robbery	Evidence	26.619 ***	0.013	20.641 *	42.279 ***
	No-Evidence				
Assault/Battery	Evidence	7.910 ***	0.708	0.177	6.908
	No-Evidence				
Burglary/Property	Evidence	50.019 ***	0.000	37.511 ***	13.788 ***
	No-Evidence				

Chi Square Significance: * p < .05
 ** p < .01
 *** p < .001

APPENDIX D

LOG-LINEAR ANALYSIS

Log-linear analysis is well suited to our need to examine the marginal effects of physical evidence on selected response variables while controlling for the effects of a number of other investigative factors commonly used in criminal investigations. Everyman's Contingency Table Analysis (ECTA), a computer program developed to carry out the log-linear analyses developed by Goodman and Fay (1973), was used throughout the work. We also recognize the work of Greenberg et al., (1973), Greenwood (1975), Forst (1977) and Eck (1979) which provided a number of valuable insights and suggestions regarding those variables which may be useful in explaining case outcome and analytical techniques for quantifying the effects of different factors on case outcome.

As noted in Chapter VII, the work presented in this report is exploratory due to relatively small sample sizes. This Appendix includes all the raw frequency tables. It, also, contains the difference in likelihood chi square values used to test the independence of EVIDENCE and the three dependent variables and to find the simplest models which explain the data reasonably well. Although the data set developed in this study has a relatively parsimonious structure, it was found that the various independent variables (EVIDENCE included) do not work in a simple additive fashion on the response variables, but interact with one another in their effects on case outcome.

Evidence and Clearance

Tables D-1, D-2 and D-3 provide all the raw frequencies for the 288 cells for the 1,650 cases, where clearance is the response variable. The variables are defined in Table VII-1 in the main body of the report. Tables D-4 and D-5 provide the results for empirical odds for clearance across offenses and across jurisdictions. Other aggregations, across levels of WITNESS are equally easily derived from Tables D-1, D-2 and D-3 and will not be given here.

Table D-1

EMPIRICAL ODDS FOR CLEARANCE - ROBBERY (0 = 1)

VARIABLE			JURISDICTION				TOTAL
E	T	W	1	2	3	4	
1	1	1	0/2	0/0	0/1	0/2	0/5
2	1	1	1/0	0/0	0/1	0/0	1/1
1	2	1	0/3	0/0	0/2	0/0	0/5
2	2	1	0/1	1/1	0/0	0/0	1/2
1	1	2	4/24	11/12	15/51	6/49	36/136
2	1	2	0/0	7/3	6/15	11/1	24/19
1	2	2	4/22	13/10	5/29	3/24	25/85
2	2	2	6/3	6/7	13/15	11/4	36/29
1	1	3	2/0	5/0	5/0	6/2	18/2
2	1	3	1/0	2/0	3/0	3/0	9/0
1	2	3	3/1	3/0	5/0	5/0	16/1
2	2	3	3/1	7/1	4/0	9/0	23/2
65/16	34/47	7/63/11	24/57				
54/35	40/49	2/69/18		55/34			
113/57	97/73	4/49/17			56/114		
97/39	80/56	2/109/25				54/82	
329/147	251/225	15/390/71					189/287
476	476	476	81	89	170	136	476

* This table gives cell frequencies in odds for clearance across all 36 cells with OFFENSE at level 1 (Robbery). The totals and subtotals convey odds for no evidence, odds for response time of 10+ minutes, and odds for the three levels of WITNESS broken out by JURISDICTION and totalled.

Table D-2

EMPIRICAL ODDS FOR CLEARANCE - ASSAULT (0 = 2)

VARIABLES			JURISDICTION				TOTAL	
E	T	W	1	2	3	4		
1	1	1	0/6	0/0	1/7	2/2	3/15	
2	1	1	1/1	0/0	0/7	0/0	1/8	
1	2	1	3/1	0/3	1/1	0/0	4/5	
2	2	1	1/2	0/2	0/0	1/3	2/7	
1	1	2	1/7	5/3	15/15	6/13	27/38	
2	1	2	2/0	2/3	3/4	4/0	11/7	
1	2	2	4/3	8/8	3/3	3/3	18/17	
2	2	2	12/2	0/8	6/4	4/1	22/15	
1	1	3	8/7	7/3	20/3	33/14	68/27	
2	1	3	3/0	8/0	11/0	4/0	26/0	
1	2	3	33/5	11/2	14/1	24/2	82/10	
2	2	3	40/1	36/0	13/1	15/0	104/2	
78/65	36/107	15/31/97	--- 108/35					
50/59	31/78	5/37/67	----- 77/32					
84/49	86/47	17/53/63	----- 87/46					
102/32	78/56	8/34/92	----- 96/38					
314/205	231/288	45/155/319	----- 368/151					
519	519	519	143	109	133	134	519	

Table D-3

EMPIRICAL ODDS FOR CLEARANCE - BURGLARY (0 = 3)

VARIABLE			JURISDICTION				TOTAL
E	T	W	1	2	3	4	
1	1	1	3/56	3/40	3/96	3/53	12/245
2	1	1	3/7	2/30	5/19	2/5	12/61
1	2	1	2/22	1/10	1/31	0/7	4/70
2	2	1	3/5	0/8	1/6	4/1	8/20
1	1	2	1/9	0/3	0/5	2/8	3/25
2	1	2	2/0	5/5	1/3	3/1	11/9
1	2	2	0/1	4/1	1/0	1/4	6/6
2	2	2	7/0	1/1	4/0	1/1	13/2
1	1	3	1/4	3/1	4/1	8/0	16/6
2	1	3	5/1	10/0	2/1	6/0	23/2
1	2	3	2/1	22/1	4/1	10/1	38/4
2	2	3	20/1	15/0	9/1	13/0	57/2
102/54	92/64	101/20/35	----- 49/107				
89/77	102/64	94/20/52	----- 66/100				
147/52	140/59	162/14/23	----- 35/164				
97/37	91/43	75/21/38	----- 53/81				
<u>435/220</u>	<u>425/230</u>	<u>432/75/148</u>	-----				203/452
655	655	655	156	166	199	134	655

Table D-4

EMPIRICAL ODDS FOR CLEARANCE ACROSS ALL OFFENSES

VARIABLE			JURISDICTION				TOTAL
E	T	W	1	2	3	4	
1	1	1	3/64	3/40	4/104	5/57	15/265
2	1	1	5/8	2/30	5/27	2/5	14/70
1	2	1	5/26	1/13	2/34	0/7	8/80
2	2	1	4/8	1/11	1/6	5/4	11/29
1	1	2	6/40	16/18	30/71	14/70	66/199
2	1	2	4/0	14/11	10/22	18/2	46/35
1	2	2	8/26	25/19	9/32	7/31	49/108
2	2	2	25/5	7/16	23/19	16/6	71/46
1	1	3	11/11	15/4	29/4	47/16	102/35
2	1	3	9/1	20/0	16/1	13/0	58/2
1	2	3	38/7	36/3	23/2	39/3	136/15
2	2	3	63/3	58/1	26/2	37/0	184/6
245/135	162/218	123/114/143	--	181/199			
193/171	173/191	101/126/137	-----	198/166			
344/158	323/179	183/216/103	-----	178/324			
296/108	249/155	85/164/155	-----	203/201			
1078/572	907/743	492/620/538	-----	760/890			
1650	1650	1650	380	364	502	404	1650

Table D-5

EMPIRICAL ODDS FOR CLEARANCE ACROSS ALL JURISDICTIONS

VARIABLE			OFFENSE			TOTAL	
E	T	W	1	2	3		
1	1	1	0/5	3/15	12/245	15/265	
2	1	1	1/1	1/8	12/61	14/70	
1	2	1	0/5	4/5	4/70	8/80	
2	2	1	1/2	2/7	8/20	11/29	
1	1	2	36/136	27/38	3/25	66/199	
2	1	2	24/19	11/7	11/9	46/35	
1	2	2	25/85	18/17	6/6	49/108	
2	2	2	36/29	22/15	13/2	71/46	
1	1	3	18/2	68/27	16/6	102/35	
2	1	3	9/0	26/0	23/2	58/2	
1	2	3	16/1	82/10	38/4	136/15	
2	2	3	23/2	104/2	57/2	184/6	
329/147			251/225			15/390/71-	189/287
314/205			231/288			45/155/319	----- 368/151
435/220			425/230			432/75/148	----- 203/452
1078/572			907/743			492/620/538	----- 760/890
1650			1650			1650	476 519 655 1650

Since C is the response variable, it is easiest to think in terms of the empirical odds for clearance $f(1jklmn) / f(2jklmn)$ for cell $jklmn$ of the factors E, T, W, O, and J. An example included in the main body of the report was the empirical odds for clearance of Peoria (J=1) assault (O=2) cases (12/2) where there was a witness but no suspects (W=2), the cases had physical evidence (E=2) and the elapsed reporting time to the police was ten minutes or less (T=2).

Let $m(ijklmn)$ denote the expectation of the logarithm of $(f(ijklmn) + .5)$. In all log-linear analyses, the raw frequencies were incremented by .5 for the ECTA application. This is recommended procedure because of the small cell frequencies. The reader may wish to consult Feinberg (1980), Haberman (1978) and Upton (1978) who all treat log-linear analysis at an applied level.

The so-called saturated model represents each $m(ijklmn)$ by a linear combination of a grand mean, λ , main effects $\lambda(C;I)$, $\lambda(E;J)$, $\lambda(T;K)$, $\lambda(W;L)$, $\lambda(O;M)$, $\lambda(J;N)$, interactions, etc., all the way to the highest order interaction $\lambda(CETWOJ;IJKLMN)$. The saturated model has as many free lambda (λ) parameters as cells, i.e., here 288, so it fits the incremented data perfectly. Obviously, the saturated model is no simplification, although the parameters have interesting interpretations.

The first use of log-linear analysis is to test the independence of C (clearance) and E (evidence), conditional on the other factors T, W, O, J. The hypothesis being tested is that for each given combination of levels of factors, T, W, O, J, EVIDENCE has no effect on CLEARANCE (clearance rates or odds for clearance). The test is carried out by successively fitting the models CTWOJ/ETWOJ and CTWOJ/ETWOJ/CE. The improvement in fit of the latter over the former is measured by the

difference in likelihood chi-squares which provides a test statistic for the hypothesis. The large DIFFERENCE chi-square in Table D-6 below, indicates that C and E are not conditionally independent.

TABLE D-6

Model	Chi - Square	d.f.
CTWOJ/ETWOJ	161.78 **	72
CTWOJ/ETWOJ/CE	91.99	71
	69.79 ** (See Footnote)	1

This preliminary test provides strong evidence that C and E are associated given control for the effect of the other factors T, W, O, J. Generally speaking, there is considerable variation in odds for clearance explained by E, in addition to the variation explained by the other factors T, W, O, J.

The object of log-linear analysis now becomes to find a simple model that fits the data well and is simple enough so that the relatively few λ -parameters it has can be easily interpreted. In this way the association of clearance (C) and evidence (E) can be quantified.

Superscripts * and ** indicate statistical significance at levels .10 and .05 respectively. The chi-squares measure lack-of-fit for the models.

As Upton suggests, the highest order interaction between factors ETWOJ should be included in all models in order to control for the interplay of the five factors. (All models fit are called hierarchical, which means if ETWOJ is included so are all lower order interactions and main effects for the factors E, T, W, O, J.) This control takes 144 degrees of freedom from the original 288. An example of a model fitted in implementing the above approach is ETWOJ/CET/CEW/CEO/CEJ/CTW/CTO/CTJ/CWO/CWJ/COJ. Table D-7 gives the chi-square for this model and for a simpler nested model where each factor has an additive effect on the log odds for clearance. The results show that the more complicated model fits the data well and that the simpler additive model does not fit the data well. Thus, the data suggests that there are interactive effects of the factors E, T, W, O, J on clearance.

TABLE D-7

Model	Chi - Square	d.f.
ETWOJ/CE/CT/CW/CO/CJ	187.04 **	134
ETWOJ/CET/CEW/.../COJ	87.71	103
	99.33 **	31

There are many different models that fit the data reasonably well. Each can be used to display various features of the association of the presence of physical evidence and the odds for clearance. We will follow Upton (1978) in regards to the method used to pick a model. He suggests fitting the saturated model first as a guide to subsequent models. The statistically insignificant λ -effects are dropped and the

resulting simpler model fit to the data. The process is continued until a simple model is found that fits the data reasonably well. Of course, some data sets cannot be fit very well by simple models. Fortunately, the data set developed in this study has a relatively parsimonious structure. The interactions involving C that are significant in the saturated model are CEWO, CEWJ and CT. The model

(M1) ETWOJ/CEWO/CEWJ/CT

was fit and each of the indicated interactions remained statistically significant (defined here to mean having an estimate with a standardized value of magnitude of at least 2). Model M1 takes up to 171 degrees of freedom and has a lack-of-fit chi-square value of 87.17 with 107 degrees of freedom.

The main effects of factors E, T, and W on C are all statistically significant as seen by the standardized values for the λ -effects $\lambda(CE)$, $\lambda(CT)$, $\lambda(CW)$. Since higher order interactions involving C, E, W, O, J are significant, only the main effect $\lambda(CT)$ has a direct and useful interpretation. The estimate $\hat{\lambda}(CT;11) = .1037$ has a standard error .0508. But $\hat{\lambda}(CT;11) - \hat{\lambda}(CT;21) = -.2074$ measures the effect of T at level 1 on log odds for clearance and $\hat{\lambda}(CT;12) - \hat{\lambda}(CT;22) = .2074$ measures the effect of T at level 2 on log odds for clearance. Hence, a quick response time (10 minutes or less) improves log odds for clearance by an estimated .4148. Exponentiating .4148 gives 1.51 as the factor by which odds for clearance are improved by having a quick response.

In this study the main concern is the quantification of the effect of evidence E on odds for clearance. Unfortunately, the significant interactions $\lambda(\text{CEWO})$ and $\lambda(\text{CEWJ})$ demonstrate that the association of E and C depends upon the levels of the other factors W, O, J.

The next step is to produce a table that gives the estimated effect that having physical evidence has on odds for clearance for each of the $3 \times 3 \times 4 = 36$ combinations of levels of the factors W, O, J. We first show how a particular entry is derived. The expected log odds for clearance in cell jklmn (levels j,k,l,m,n, for E, T, W, O, J, respectively) is $m(1jklmn) - m(2jklmn)$ which for Model M1 is

$$\begin{aligned} \log \text{ odds (JKLMN)} &= 2[\lambda(\text{C};1) + \lambda(\text{CE};1\text{J}) + \lambda(\text{CT};1\text{K}) \\ &+ \lambda(\text{CW};1\text{L}) + \lambda(\text{CO};1\text{M}) + \lambda(\text{CJ};1\text{N}) + \lambda(\text{CEW};1\text{JL}) \\ (1) \quad &+ \lambda(\text{CEO};1\text{JM}) + \lambda(\text{CEJ};1\text{JM}) + \lambda(\text{CWO};1\text{LM}) \\ &+ \lambda(\text{CWJ};1\text{LN}) + \lambda(\text{COJ};1\text{MN}) + \lambda(\text{CEWO};1\text{JLM}) \\ &+ \lambda(\text{CEWJ};1\text{JLN})]. \end{aligned}$$

In writing (1) we have used the fact that differences $\lambda(\text{ ;1JKLMN}) - (\lambda;2JKLMN) = 2\lambda(\text{ ;1JKLMN})$.

The relevant question is "What effect does having physical evidence (E at level 2) have on odds for clearance?" The answer is log odds (2KLMN) - log odds (1KLMN) exponentiated to give the factor by which odds for clearance are improved by having physical evidence over not

having physical evidence. Differencing (1) from J=2 to J=1 gives the Improvement in Log Odds for Clearance: ILOC. Since there is no interaction involving C, E and T, it can be seen that ILOC depends only upon the levels LMN for factors W, O and J, the result being

$$\begin{aligned} \text{ILOC (LMN)} &= -4 [\lambda(\text{CE};11) + \lambda(\text{CEW};11\text{L}) \\ (2) \quad &+ \lambda(\text{CEO};11\text{M}) + \lambda(\text{CEJ};11\text{N}) \\ &+ \lambda(\text{CEWO};11\text{LM}) + \lambda(\text{CEWJ};11\text{LN})] \end{aligned}$$

(In writing (2) we have used the fact that a λ with E at level J=2 is the negative of that λ with E at level J=1.) Using the ECTA output for Model M1, and keeping in mind that the printed λ -effect involving any two-level factor is for that factor at level 1, we find, for example, the estimate

$$\begin{aligned} \text{ILOC (134)} &= -4[-.2446 + .0615 \\ &- .1125 - .1883 \\ &- .0952 + .0487] = 2.1216. \end{aligned}$$

Exponentiating gives the factor 8.34 as the estimated effect on odds for clearance of having physical evidence over having no physical evidence when W is at level 1 (No witness, No suspect), O is at level 3 (Burglary) and J is at level 4 (Oakland).

The factors for all possible combinations of levels of W, O, J are found in Tables VII-1, 2 and 3 in the main body of the report.

A variety of models were fit in addition to M1. Some models were fit to the raw frequencies not incremented by .5. The reported findings which quantified the relationships of evidence and odds for clearance are substantially in agreement with the results of these unreported analyses and demonstrate that the findings are not simply an artifact of the choice of the model M1 to fit the data.

Evidence and Conviction

The variables used in the two analyses with CONVICTION as the response variable are defined in Table VII-4. The data base is made up of the 664 incidents in the sample where arrests were made.

Because the sample size was not large enough to analyze all the variables D, E, R, T, W, O, J simultaneously, two separate analyses D E R O J and D E T O J were performed. The raw empirical odds appear in Table D-8 and are aggregated in contingency tables D-9 and D-10. Because of the sparcity of data for variable W at level 1, log linear analysis of D E W O J was not attempted.

TABLE D-8 EMPIRICAL ODDS FOR CONVICTION IN DERTWOJ

W	J=1			J=2			J=3			J=4			Total
	0=1	0=2	0=3	0=1	0=2	0=3	0=1	0=2	0=3	0=1	0=2	0=3	
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/0	0/0	0/1	0/2
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/0	0/0	0/0	0/0	1/0
1	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1	0/0	0/0	0/0	2/1
1	0/0	0/0	2/3	0/0	0/0	1/3	0/0	0/1	0/2	0/0	0/0	0/1	3/1
1	0/1	0/0	0/3	0/1	0/0	0/2	0/0	0/0	2/0	0/0	0/0	1/1	3/6
1	0/1	0/0	2/4	0/0	0/0	0/0	0/0	0/0	1/0	0/0	0/1	0/0	3/6
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1	0/0	1/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	1/1
1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/1	0/1
2	2/2	1/6	0/0	3/3	3/7	0/0	0/10	2/25	0/4	0/3	6/9	0/2	17/7
2	0/0	2/8	0/1	1/1	0/4	0/1	0/1	0/5	1/0	0/0	3/5	0/1	7/2
2	0/0	6/6	1/1	0/0	0/3	1/0	0/1	0/2	0/1	1/0	2/2	0/0	11/1
2	0/1	3/1	0/2	11/9	3/1	1/2	0/13	1/5	0/2	3/2	3/2	1/0	26/4
2	1/10	2/2	0/2	3/2	4/1	2/8	6/9	1/3	1/2	7/6	2/1	1/2	30/3
2	4/0	3/4	10/2	3/3	0/0	1/1	3/6	0/0	2/1	4/3	1/0	3/3	34/2
2	0/0	4/0	0/0	0/0	0/3	2/0	0/0	0/4	0/0	0/2	1/14	1/1	8/2
2	0/0	1/2	0/0	2/1	4/8	0/0	0/0	1/2	0/0	0/0	1/1	0/0	9/1
2	0/0	7/5	1/0	0/0	3/3	1/0	0/0	0/9	0/1	0/0	0/2	0/0	12/2
2	0/1	9/1	1/0	7/0	4/4	17/9	0/5	1/5	1/1	1/1	4/7	5/10	50/4
2	1/0	6/1	6/0	2/1	2/6	7/4	2/1	0/2	2/1	0/1	1/2	1/3	30/2
2	3/0	1/0	8/3	2/1	3/3	1/1	0/0	1/2	3/2	4/3	0/2	5/1	31/1
S	11/6	47/36	31/21	34/22	26/43	34/31	11/46	7/65	15/19	20/21	24/48	18/28	278/3

Table D-9 EMPIRICAL ODDS FOR CONVICTION IN DEROJ

VARIABLES			JURISDICTION			
E	R	O	1	2	3	4
1	1	1	2/2	3/3	0/10	0/5
2	1	1	0/0	3/2	0/1	0/0
3	1	1	0/0	0/0	0/1	1/0
1	2	1	0/2	18/9	0/18	4/3
2	2	1	2/1	5/4	8/10	7/7
3	2	1	7/1	5/4	3/6	8/6
1	1	2	5/6	3/10	2/29	7/23
2	1	2	3/10	4/12	1/7	4/6
3	1	2	14/11	3/6	0/11	2/4
1	2	2	12/2	7/5	2/11	7/9
2	2	2	9/3	6/7	1/5	3/3
3	2	2	4/4	3/3	1/2	1/3
1	1	3	0/0	2/0	0/5	1/4
2	1	3	0/1	0/1	2/0	0/1
3	1	3	2/1	2/0	1/3	0/0
1	2	3	3/5	19/14	1/5	6/11
2	2	3	6/5	9/14	5/3	3/7
3	2	3	20/9	2/2	6/3	9/4

Table D-10 EMPIRICAL ODDS FOR CONVICTION IN DETOJ

Variables			Jurisdiction			
E	T	O	1	2	3	4
1	1	1	2/3	14/12	0/23	3/5
2	1	1	1/1	4/4	6/10	7/6
3	1	1	4/1	3/3	3/7	5/3
1	2	1	0/1	7/0	0/5	1/3
2	2	1	1/0	4/2	2/1	0/1
3	2	1	3/0	2/1	0/0	4/3
1	1	2	4/7	6/8	3/31	9/11
2	1	2	4/10	4/5	1/8	5/6
3	1	2	10/10	0/3	0/2	3/3
1	2	2	13/1	4/7	1/9	5/21
2	2	2	8/3	6/14	1/4	2/3
3	2	2	8/5	6/0	1/11	0/4
1	1	3	2/5	2/5	0/9	1/4
2	1	3	0/6	2/11	5/2	2/4
3	1	3	13/7	2/1	4/3	3/3
1	2	3	1/0	19/9	1/1	6/16
2	2	3	6/0	7/4	2/1	1/4
3	2	3	9/3	2/1	3/3	5/2

Analysis of D,E,R,O,J.

As in the other sections, we begin by conducting a test of conditional independence of E and the response variable.

TABLE D-11

Model	Chi - Square	d.f.
DROJ/EROJ	53.27	48
DROJ/EROJ/DE	46.90	46
	<u>6.37 **</u>	<u>2</u>

Here both models fit the data well but the difference in chi-squares 6.37 is significant at the level .05 indicating that D and E are not conditionally independent.

To test the additive model against the model with two-at-a-time interactions, consider

TABLE D-12

Model	Chi - Square	d.f.
EROJ/DE/DR/DO/DJ	66.46 *	63
EROJ/DER/DEO/.../DOJ	25.97	40
	<u>40.49 **</u>	<u>23</u>

The difference in chi-squares shows the great improvement in fit when interactions are included.

Starting with the saturated model as a guide and eliminating insignificant estimated lambda effects results in the fairly simple model

$$(M2) \quad EROJ/DEO/DEJ/DOJ.$$

This model has lack-of-fit chi-square value 43.14 with 48 d.f. so it fits the incremented cell frequencies very well.

Using this model and the estimated lambda effects, we can calculate the estimated improvements in Log-Odds for D (Conviction) and their exponentials. The contrasts are with E at level 2 minus E at level 1, 3-1 and 3-2. Here, the estimates are functions of O (OFFENSE) and J (JURISDICTION) since in M2 E interacts with O and J in regard to its effect on D (Conviction).

The log odds for conviction with E, O, J at levels J, M, N are in Model M2:

$$(5) \quad \begin{aligned} \log \text{ odds } (JMN) = & -2 [\lambda(D;1) + \lambda(DE;1J) + \lambda(DO;1M) + \lambda(DJ;1N) \\ & + \lambda(DEO;1JM) + \lambda(DEJ;1JN) + \lambda(DOJ;1MN)] \end{aligned}$$

Differencing (5) from J=2 to J=1 gives

$$(6) \quad \begin{aligned} ILOD (2-1;MN) = & -2 [\lambda(DE;12) - \lambda(DE;11) \\ & + \lambda(DEO;12M) - \lambda(DEO;11M) + \lambda(DEJ;12N) - \lambda(DEJ;11N)] \end{aligned}$$

Tables VII-6, 7 and 8 give the exponentiated ILOD's for the differences 2-1, 3-1 and 3-2, i.e., the improvement factors for odds for conviction for three different contrasts in levels of the Factor E.

Analysis of D,E,T,O,J.

The conditional independence test is carried out using:

TABLE D-13

Model	Chi - Square	d.f.
DTOJ/ETOJ	62.84 *	48
DTOJ/ETOJ/DE	55.15	46
	<u>7.69 **</u>	<u>2</u>

The simpler model did not fit the data and the difference in chi-squares 7.69 is significant at level .05.

The test of the additive model versus the two-at-a-time interaction model is carried out with:

TABLE D-14

Model	Chi - Square	d.f.
ETOJ/DE/DT/DO/DJ	97.11 **	63
ETOJ/DET/DEO/.../DOJ	32.16	40
	<u>64.95 **</u>	<u>23</u>

Whereas the complicated model fit the data very well, the additive model is rejected.

Starting with the saturated model and eliminating insignificant estimates of lambda effects, the following model was selected to describe the DETOJ contingency table.

(M3) ETOJ/DEO/DEJ/DTJ/DOJ.

This model has a lack-of-fit chi-square value 38.63 with 44 d.f. so it fits the incremented data very well.

Using M3 to assess the impact of evidence we note that, E interacts with both O and J separately in its effect on D. The log odds for conviction with E, T, O, J at levels J,K,M,N are

$$\log \text{ odds (JKMN)} = -2 [\lambda(D;1) + \lambda(DE;1J) + \lambda(DT;1K)$$

$$(7) \quad + \lambda(DO;1M) + \lambda(DJ;1N) + \lambda(DEO;1JM)$$

$$+ \lambda(DEJ;1JN) + \lambda(DTJ;1KN) + \lambda(DOJ;1MN)]$$

Differencing (7) from J=2 to J=1 gives

$$\text{ILOD (2-1;MN)} = -2 [\lambda(DE;12) - \lambda(DE;11)$$

$$(8) \quad + \lambda(DEO;12M) - \lambda(DEO;11M) + \lambda(DEJ;12N) - \lambda(DEJ;11N)]$$

Tables VII-9, 10 and 11 give the exponentiated increase in log odds for conviction for the differences 2-1, 3-1 and 3-2, i.e., the improvement factors for odds for conviction for the three contrasts in levels of the Factor E.