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IMPROVING EVIDENCE GATHERING THROUGH A COMPUTER-ASSISTED
CASE INTAKE PROGRAM: FINAL REPORT

by

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POLICE-PROSECUTOR COORDINATION AND CASE ATTRITION

I. Introduction

A. Background

In the 1920's a series of crime commissions documented the patterns of

case attrition from criminal justice systems in several states (Illinois

Association for Criminal Justice, 1929; Missouri Association for Criminal

Justice, 1926; Pound and Frankfurter, 1922; United States National Commission

on Law Observance and Enforcement, 1931). These "mortality charts" revealed

some unsettling things:

o   Over half of felony arrests resulted in dismissal of all charges

o   From 4% to 67% of felony arrests were reduced to mis-
     demeanors

o   From 50% to 86% of convictions were the result of
     guilty pleas, not jury trials

o   Only 6% to 14% of felony arrests went to trial and only
     some of those trials were with juries.

These findings provoked grave concern. What did they mean? Should the

community be alarmed or gratified, soberly critical or morally outraged? Were

the agencies of criminal justice failing to do their jobs? Was radical reform

needed? Were the police making unlawful arrests? Were they failing to

investigate and prepare cases? Were prosecutors and judges throwing out

prosecutable cases? If some attrition is necessary, how much is appropriate?

Given the variety in the patterns of attrition that were found to exist, would

it be possible to say that one pattern was better or worse in some sense than

another?

These and other questions were raised but have yet to be adequately

discussed, much less settled. Answering them required both additional

empirical work to understand attrition and, most importantly, philosophical

and policy analyses of the normative as well as the practical merits of

alternative patterns of attrition.

In the intervening years, especially since the 1970's, empirical research

on attrition as has mushroomed (e.g.,Brosi, 1979; Vera Institute of Justice,

1977; and Boland and Brady, 1985). But little progress has been made regarding

the normative side of this matter. A jurisprudence of attrition has yet to

develop.

Some consensus has formed within a certain group of thinkers.   Local and

national crime commissions and standard-setting groups have generally

converged in support of the proposition that some cases (for reasons of

equity or the **de minimis** nature of the offense or the weakness of the

evidence) should be screened out of the system as early as possible and that

this decision should be made by the prosecutor (as opposed to the police or a judicial officer) (McDonald, 1985).

But as a practical matter early case screening by prosecutors is not feasible in many jurisdictions. Also, it leaves unanswered many hard questions like: "How weak is 'weak'?" and; "How early is 'early'?" And, most importantly, it is a consensus that is largely limited to elite standard-setting groups and not widely shared among practitioners. Moreover, even among the commentators and standard-setters the consensus breaks down over the details of specific issues, such as what constitutes proper charging (McDonald, 1985).

B. Three Perspectives on Case Attrition

Among attrition studies, three distinct focal concerns can be identified: fairness, efficiency and effectiveness. Scholars suspecting bias in the operation of the criminal justice system have tried to determine whether extra-legal factors (such as race, class, or sex) significantly influence the dispositions of individual cases.

For others the question of fairness has been approached from the perspective of due process of law. They have been critical of the justice system's reliance on the institutions of plea bargaining and on something loosely called "overcharging" (i.e. the practice by police and/or prosecutors of charging cases with the maximum number and degree of charge only to be reduced subsequently in exchange for a guilty plea).

Reform groups, such as the early crime commissions, concerned with improving the efficiency of the court system and recognizing that many cases do eventually drop out of the system, have recommended that cases should be screened as early as possible; that this be done by the prosecutors' office; and that a very high standard of legal proof be used as the threshold criterion for admitting cases in to the court system.

Researchers concerned about effectiveness have tried to identify those aspects of the criminal justice system and its environment which adversely affect the disposition of cases. This line of research has been directed at reducing to a minimum the extent to which poor or inadequate law enforcement or judicial practices prevent cases from being disposed of strictly on their evidentiary merits (as opposed to errors or inefficiencies in the system that processes them). The hope has been to identify aspects of case handling that criminal justice officials can control and could do something about such that the existing local pattern of case attrition could be changed (such as the quality of police investigation or training or the quality of communication between police and prosecutors).

Writers working on any one of the three focal concerns sometimes use the phrase, "inappropriate case attrition". But clearly this salubrious phrase means different things to different users. Imbedded in it are crucial normative choices about which reasonable people do disagree.

It may be used to refer to case dispositions that are considered inappropriate because they were influenced by extra-legal factors; or were

disposed of at a later stage in the justice process than they could have been had there been rigorous early screening; or were disposed of too early in the process; or were given a disposition considered to be too lenient or too severe or too inaccurate (because of charge bargaining).

Sometimes the phrase, "inappropriate case attrition," refers to cases that are given dispositions that are different (usually meaning, more lenient) than they should have and would have received but for some flaw or deficiency in the criminal justice system's operation.

It is this last meaning of the phrase that underlies our project as well as the five other related projects funded by the National Institute of Justice. They grew out of a series of earlier NIJ studies with a similar focus.

II. The Proposal

A. Project Purpose

Our project was an attempt to reduce inappropriate case attrition in two ways: directly by improving the quality of case information transmitted by the police to the prosecutor and indirectly by improving the quality of the police investigations. The direct effect was to occur through the use of a computer program designed to simulate as far as possible the kind of interview that might occur between a prosecutor and a police officer during a case review. Police officers give their case reports by interacting with a computer terminal which prompts them for the information needed.

The indirect effect of the program was to occur through the learning function associated with the use of the software. That is, after repeated entry of cases with the assistance of the computer, it would be expected that police officers would begin to alter their investigative technique in the direction of being able to respond to the questions asked by the computer. In as much as the computer asked for more detailed and comprehensive information than is obtained from the traditional, manual police report, this change should be in the direction of improved investigative technique, i.e., obtaining more information in the field. (Although this indirect effect was hypothesized, there were no plans in this project to test for it because the effect would not have occurred until after the timeframe permitted by the project.)

B. Previous Research

This project grew out of the findings of several earlier NIJ studies particularly the survey of police-prosecutor relations in the United States by McDonald and associates (1982). They found it useful to conceive of the criminal justice process as a communication process in which the police serve as gathers and transmitters of data (evidence) to prosecutors (and judges) who interpret it and make decisions. Thus the quality of the decisions being made by prosecutors (and judges) is determined in part by the quality of the communication process through which case-related data is transmitted from the police to the prosecutor (and judge).

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The study also found the prosecutors everywhere complained that they were
making less than optimal decisions because the police failed to supply them
with adequate information. This failure was attributed to several factors
including:

o   **inadequate incentives** (the police culture and reward
     system emphasizes arrests rather than convictions as
     measures of police performance)

o   **inadequate training** (the police are not given the
     opportunity to learn the problems of prosecution
     particularly the crucial importance of detail, nuance,
     comprehensiveness and redundancy in the case files used
     for prosecution)

o   **inadequate feedback** (the police do not learn of the ways
     that they contribute to inappropriate case attrition
     because they get virtually no feedback on the dispositions
     of their cases or the reasons for the dispositions)

o   **escalating costs** (face-to-face case screening between
     police and prosecutors is being reduced in jurisdictions
     that once could afford them because of increased costs of
     police overtime)

o   **attitudes** (for various reasons of their own the police
     deliberately withhold or fail to transmit data to
     prosecutors: e.g. to hide evidentiary weaknesses or
     questionable practices; to prevent prosecutors from giving
     the case away to defense attorneys; to minimize their
     report-writing efforts)

o   **technology** (the physical means by which police reports are
     produced, copied, stored, and transmitted to prosecutors
     causes data degradation e.g. poor handwriting, illegible
     xerox copies, inadequate format for capturing data
     elements, poor spelling)

o   **coordination** (numerous separate documents from several
     different agencies and different branches within the same
     agency must be assembled but often parts are missing, e.g.
     rap sheets, results of forsenics tests, warrants, results
     of line-ups, supplemental investigation reports)

o   **organization** (police and prosecutors in many places do not
     meet with each to review cases
     and can not easily reach each other to discuss cases).

C. Underlying Assumptions

The most effective method of case-related communications between police and prosecutors was identified as the early face-to-face case review between experienced prosecutors and the police officers involved in the particular cases. The fact that these reviews occurred close to the time of arrest meant that missing information and hot-leads could be identified and pursued with a greater chance of success. Unfortunately, however, this method was also the most costly and was being cut back in some jurisdictions.

Among the possible solutions to the problems of police-prosecutor communication suggested by McDonald et al. was to try to simulate this optimal-but-costly face-to-face review with a computer-assisted case reporting program that could operate on the relatively inexpensive microcomputers. Our present project was in effect an attempt to implement the solution suggested by our earlier study.

The idea for such a program had several attractive features. If the program could operate on microcomputers then it would be affordable by most police departments. The fact that reports would be typed would reduce the problem of the illegibility of handwritten reports. The ability of the computer to branch off into a series of sub-questions contingent upon answers to earlier questions allowed for the possibility of mimicking the kind of questioning that would occur between a police officer and a prosecutor in a live case review.

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The software was not intended to be just an electronic version of the standard police report form. It was not to display simply a template of items of information to be filled in. It would probe for subsequent details contingent upon initial details. These probes would be particularly designed to obtain the kind of information needed by the prosecutor in order to have the strongest evidentiary position that the available facts could support.

It was recognized from the start that even the best computer program would be a big step down from a live, face-to-face case review between a prosecutor and a police officer. Some of the problems of communication might continue. The police might still try to withhold information, for example. All of the nuance and body-language of the reporting officer would be lost. We had no illusions about the limitations of any computer simulation of live human interactions.

But, on the other hand, the computer seemed to offer a solution to a problem that many prosecutors had reported, namely, that the police are often aware of a lot more information than they actually transmit to prosecutors because they do not recognize its importance for prosecution or simply are not asked for it. (For example, the police often fail to report false exculpatory statements by the defendant evidently because they erroneously think that anything less than a full confession is worthless to a prosecutor.)

With its ability to branch and probe, the computer offered the potential for extracting such information in a cost effective way. Also, the computer would bring a degree of standardization to the quality of police reports. All

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officers entering cases would have to, at least, address all relevant questions. Some officers might still choose to enter "no answer" or "unknown" to some questions in order to deliberately withhold information. But controls could be built into the software so that such answers would not be accepted for many items; and for still other items (such as, dates, case identification numbers, officer identification numbers and other items) ranges of legitimate values could be built in so that illegitimate values would not be accepted (regardless of whether they were being entered deliberately or accidently). Such controls would be a major improvement over the existing manual system of report-writing wherein the only control is the typically superficial review of the commanding officer.

Our goal was not to produce software that would make the best police report writers even better; or even to make the worst writers as good as the best. Rather it was to bring the overall average quality of all police reports up to a minimum, predictable standard of thoroughness.

The model that we hoped to approximate was something like a computerized version of a case preparation unit operated by the Nashville Police Department (described in Chapter 4). McDonald and associates had discussed this unit as an illustration of the potential feasibility of a computer-assisted case preparation computer program. The unit consists of typists and supervisory police officials. Police officers dictate their reports into magnetic tapes under the guidance of the unit's supervisors who may interrupt the dictation for clarification or expansion of the details. The tapes are then transcribed.

When the unit first began it developed a set of crime-specific
interrogatories which were designed to ensure that the legal elements of the
case were adequately addressed by the reporting officer. These were used by
para-legals (law students) to guide reporting police officers through their
reports. It was claimed that the typists became so familiar with these
interrogatories that even they were able to ask for clarification.

The main disadvantage of the case preparation unit is its costs. It
operates almost twenty-four hours a day seven days a week; and for most of
that time there are two command-level police officials and two typists on
duty. Such an expense is out of the question for most police departments.

Our proposed computerized version of this unit would eliminate most of
this expense. The crime-specific interrogatories would be built into the
software and the police would do their own typing.

The main disadvantage of our proposal as far as we could anticipate was
that it would require that the police do their own typing. We wrongly assumed
that this would be one of the major obstacles to the success of our software.
That is we assumed that the police would resist having to type reports and
that they would be slow and inaccurate in their typing. **In effect, we
accepted as unchallengeable a fundamental premise which in retrospect we now
seriously challenge, namely, that the police should not be required to be
reasonably good typists.**

In reality the police in our test site (Nashville, Tennessee) and in other sites that we contacted have demonstrated a willingness to type reports and the ability to do so with reasonable speed and accuracy. We now realize that **any future attempts to develop software for use by the police in applications such as the one we attempted should proceed on the assumption that the police can and should be expected to be competent typists.** Thus in the choice of the programming language and in the design of the application, itself, no undue consideration need be given to trying to minimize the amount of typing by the police.[1]

One of the major considerations in our choice of programming language and in the design of our "screens" (i.e. the visual displays on the computer monitor) was this mistaken belief that interactive software for use by the police must minimize the amount of typing on their part. Ironically, it was in part the pursuit of this objective that contributed to making our software less "user-friendly" than it might have been. In our attempt to spoon-feed the police, we choked them.

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[1] This is not to say that software design does not have to be efficient. Asking the police to type in more information than they need or making them back in and out of files will defeat the program's utility. In the Nashville Police Department we observed the nonuse of a computer program that was unrelated to our project but happened to be located in the adjoining office. The program operates on a microcomputer and is intended to help the "Crime-Stoppers" unit keep track of informants, defendants, criminal events and rewards.

The officers in the unit gave up using the program in part because it asked them for details that served no purpose of theirs and because it seemed to them inefficient in that it required them to enter case information into three different files.

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Both because of our erroneous belief that we had to minimize typing by the police and because of our fundamental premise that the police had to be led through a series of questions which they might not otherwise answer, we proceeded to make a fundamental error. We underestimated the importance of the free-form narrative section of the police report. We tried to convert as much as of the information that might be given in the free-form narrative sections of the report into questions about discreet aspects of the overall case.

However, our field test has shown us that while this may insure that certain questions will get answered it does not eliminate the prosecutor's need for the free-form section of the police report. The reporting officer must still type a narrative and some of the information in it will necessarily repeat information already given in the question-and-answer section of the report.

The narrative section is essential because it gives prosecutors a grasp of the entire event as a whole and the whole tells them something more than the sum of its parts. It allows them to see how the parts are connected together and to make inferences about missing information and the credibility of information that was reported.

D. Problems in Implementation

In the end, our project proved to be a less rigorous test of the potential of the computer to substantially improve the quality of police case preparation for prosecution than planned. The main obstacle was the

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fact that approximately one-third of the project's time was in effect lost due to matters beyond our control.

The programming language we adopted, namely, Better Basic, has deep bugs in it that not only delayed our software development schedule but seriously degraded the quality of the final software application that we wrote. Some bugs could not be remedied and had to be "programmed around" with a consequent loss in program efficiency and user-friendliness.

The scheduling delay had a domino effect on the balance of the project. It meant that the project had to use the first fully operational version of the program. No refinements based on initial field use were possible. No full-time project personnel were available to stay in the field with the computer; to get the police detectives to use it; to train them on its use; to solve program failures that occurred; and to do those various things necessary for a good field test. As a result our evaluation has been reduced to a smaller base of experience and more qualitative approach than planned.

It consists of a record of our insights gained by this experience regarding faulty assumptions and other problems of trying to achieve such a goal; and the opinions of the police who either used our software or were directly familiar with it; the opinions of the 10 prosecutors who used case files created with the assistance of our software; and, the results of a quasi-experimental design comparing differences in prosecutors's ratings of the quality of case preparation of cases prepared with the assistance of the

computer program and the same cases prepared without the computer's assistance. In addition we have incorporated the insights we gained from contact with other jurisdictions involved in using the computer in ways similar to ours.

Moreover, one part of the proposed software was deleted entirely. The software was supposed to include two "expert systems" features: help the police select the relevant charges in the case; and feedback a list of additional investigative actions that must be taken. Although we did not develop an expert system for selecting charges, we did review a prototype of such a system that has been developed by Coastal Computers, a private vendor.

III. Methodology

A. The Original Evaluation Design

Our proposal called for both a process and an impact evaluation. The process evaluation was to be based on several types of data. Firstly there was to be a description of field observations regarding the problems of developing, installing and administering the software. This was to include the difficulties in programming the various features that were planned for the software. In addition interviews were to be done with police and prosecutors regarding their experiences with and opinion of the software. Also, any legal or political challenges to or ramifications of the use of the software were to be reported. And, comments on the appropriate type of computer hardware necessary to support the system were to be given.

The impact evaluation was to be based on a before-and-after, quasi-experimental design. Cases prepared with the computer's assistance were to be compared with a matched sample of cases prepared under the traditional manual method to determine whether the computer improved the quality of case information transmitted to the prosecutor and whether this resulted in a difference in the pattern of case attrition.

This was to be done by having prosecutors rate the cases along several dimensions. One series of questions would ask for the prosecutors' rating of the quality of case preparation regarding specific aspects of the case report (e.g., its comprehensiveness, coherence and overall strength). Another series of questions would ask prosecutors to estimate what the likely disposition of each case would be.

The hypotheses to be tested were that the cases prepared with the computer's assistance would be rated as being better prepared and more likely to result in more severe dispositions than the manually prepared cases.

B. The Revised Design

Due to the problems in developing the software the evaluation design was substantially altered. Most of this report is limited to the process evaluation. It reports the underlying logic of what the software was intended to do; the problems in implementation; and observations relevant to future efforts of this kind. It includes findings from our field observations in the test site (Nashville) and interviews with police and prosecutors familiar with

the software that we created. But, these interviews are limited to ten police detectives and ten prosecutors who had direct experience with our software. In addition we have interviewed police officials from three other jurisdictions where programs involving police use of computers in ways related to our project.

Our impact evaluation was reduced to a shadow of its original plan. A greatly weakened quasi-experimental design was used in an effort to preserve some of the rigor of the original design. Two sets of the same three burglary cases were prepared. The "control" set consisted of the original manually-produced police case reports. The "experimental" set consisted of the exact same documents plus for each case a special report produced with the assistance of our software. Each of the three cases involved burglary charges and each had been originally written by different police detectives.[2]

Prosecutors were asked to rate the cases along the dimensions of quality of case preparation and estimated disposition as originally planned. The prosecutors who received the computer-assisted reports were also interviewed for their opinions of the value of the computer enhancement.

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[2]. Neither set of case reports contained the special report forms prepared by Nashville Police Department's Case Preparation Unit. A comparison against that standard would not have been appropriate for our purposes.

That is, we wanted to compare our software's case reports with the kind of manual case reports that one usually finds in most other police departments, the kind of departments that were to be the beneficiaries of our software. The question to be answered was, "How much better would a computer-assisted case report be compared to the manually produced reports that are done in most jurisdictions?"

It must be pointed out that under this weakened design the nature of the potential impact of the computer-assisted case report is limited to the impact of the _form_ of the report rather than to any possible increase in information content. That is, the experimental case reports contained no more information in them than was contained in the original manual reports from which they were copied! This is because the computer-assisted reports used in this part of our evaluation were prepared by us and not by the police officers who reported the cases. This compromise was necessary because the case reports that police officers produced with the assistance of the computer were not usable.

IV. Findings

In brief, it might be said of our project that the operation was a failure but the patient lived. The police did not make significant use of our software application. But they favored the idea behind it and they favored the development and use of a friendlier version of it in the future. The prosecutors liked the police report produced with the assistance of the software and believed it would make them more efficient. Finally, the quasi-experimental evidence suggests that the software makes a difference in the prosecutors' estimate of the case preparation and in the probable disposition of the case.

The particular software application that we managed to produce was never really used by the police to any significant extent. The nonuse was due

primarily to three factors: the delay and consequent inability to have a staff

person in the field coaxing and training officers in the use of the equipment;

the user-unfriendliness of the software as it was finally written; and the

fact that the reports produced on the computer were not scheduled to replace

the handwritten reports. Rather, they constituted duplicate work for the

officers.

However, although the police made very little use of our software, it was

not because they were opposed to the idea behind it. Indeed virtually all

detectives familiar with our software were in favor of it in principle; hoped

that further work would be done to develop it; and indicated that they would

prefer to use such a program rather than write reports manually (assuming the

software met certain conditions discussed below).

They felt that if prosecutors had to choose between manually produced

reports and ones produced with the assistance of a software application such

as ours, the prosecutors would prefer the computer-assisted reports because

of their greater legibility, clearer organization and because the computer

method seemed to help the police include more information relevant to proving

the case.[3] Moreover, even though they found it slow and difficult to use our

software, they believed that with practice they would be able to produce

reports as fast as by hand.

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[3]. One dissenting view was expressed by a detective who is
notorious among prosecutors for filing poor case reports. He
believed that prosecutors would prefer manually produced reports
because in court handwritten reports might "seem more affective
rather than 'just a computer number'".

On the other hand, when asked to compare the value of the reports produced with our software to the special prosecution reports produced by Nashville Police Department's Case Preparation Unit, most of the detectives believed that prosecutors would find the latter more useful.

There are four conditions that the detectives regarded as essential before they would use such software: (1) the software must be highly user-friendly; (2) the police would have to be adequately trained on it; (3) the report that they would type on the computer must not duplicate any other report that they would have to give; and, (4) hard-copies of the reports must be readily available if wanted. (None of these conditions were met by our program.)

The response among prosecutors to the sample case reports produced with the assistance of our software was largely positive but with some qualifications. With no training in the use of our reports, prosecutors were able to read them and understand them immediately. They liked numerous particular features of the computer-assisted case report including its legibility; its level of detail; its consistency (among different authors of reports); its summary of the roles enacted by everyone in the case; its format; and its comprehensiveness.

The prosecutors reported that the computer-assisted reports made it easier for them to quickly review the highlights of the case, an important advantage when one has to dispose of a large daily caseload without much

time for thorough preparation. But, prosecutors also pointed out some limitations of the computer-assisted reports. The most critical limitation is that the program can not eliminate the need for a free-form, narrative section to the police report. It is to the narrative that the prosecutors ultimately go in order to determine how all the parts of the puzzle fit together.

Prosecutors could not say whether having the computer-assisted report would result in any difference in what they decide to do with the case. But, we found that in two of the three cases, the presence of the computer-assisted case report had a significant effect on the prosecutors' evaluation of the quality of the case and the estimated disposition of the case. However, the effect was in opposite directions. That is, in one case the presence of the computer report resulted in prosecutors regarding the case as stronger and in the other case, weaker. This result is not what we had predicted but it is not altogether unexpected or negative.

The general hypothesis was that the presence of the computer report would improve the quality of all cases and result in estimates of more severe dispositions. But, we also acknowledged the fact that information is neutral with respect to conviction or acquittal. More or clearer information could sometimes result in cases being dropped that might otherwise have gone further. Our findings appear to confirm this possibility.

Although our particular software design does not merit further development, we have inquired about alternative software designs that hold

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promise. One is based on a design that we considered and rejected because it is more modest than what we attempted to do. Nevertheless, its comparative simplicity seems to be the key to its success. It is the one that underlies the proprietary program called ALECS by Coastal Computer Systems. It is currently fully operational and being used by two police departments who give it high praise.[4]

This software does not attempt to simulate an interview with a prosecutor (as ours does) and it does not assume weak typing skills among police officers (as ours does). It prompts officers to fill in items on a screen which is just an electronic version of the usual police report form. At the end of the report the officer types a narrative account of the event as one would do on existing police forms. The software gives no special directions or any assistance in this open-ended section of the report.

Also being prepared for optional use with ALECS is an expert system that selects charges based on a few questions that the computer asks the officer. The limited prototype model of this expert system that we reviewed demonstrates the technical feasibility of using an expert system to assist in making this limited decision. But the desirability of the use of an

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[4]. The system was produced by Coastal Computer Systems, Inc., Long Beach, New York. Its development was initiated by Lt. Joseph Lauriano of the Lynbrook (New York) Police Department. It operates on a minicomputer and can be configured to support as many as 150 terminals at one time. It does on-line booking and arrest processing and preparation of the prosecution report. It also performs other functions.

expert system for this purpose is far more problematic than the use of the rest of the system.

A second type of software is known as "CATI" (computer-assisted telephone interviewing) systems. This technology emerged in the late 1970's for use in survey research (Groves and Kahn, 1979; Freeman and Shanks, 1983; Shanks and Tortora, 1985). It has some similarities to the type of application we attempted. It presents the interviewer with the questions to be asked. He or she then keys the responses directly into the computer. Among the advantages of the CATI systems are that they permit the research much greater control over the interview process and they eliminate the time and cost associated with data transfer in manual systems.

An intriguing feature of some CATI systems is their ability to take the responses to discreet questions and assemble them into a computer-generated narrative report. Thus, _in theory_ a CATI system might be adapted to the purpose of extracting a report from a polic ᵋficer and then generating a report that contained not only a section with the fixed-format-type answers but also a section with a chronological narrative of the event. Hoewever, what is true in principal may not be practical in a given application.

Whether or not CATI systems might provide a solution to the report-producing problems of the police remains to be seen. According to one leading expert in CATI systems, Dr. Merill Shanks,[5] those systems have not yet been

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5. Director, Computer-Assisted Survey Methods Divsion, Survey Research Center, University of California, Berkeley, telephone interview, August 3, 1988.

used for applications such as writing police reports. Moreover, he cautions that while the CATI system that he uses can produce a narrative report based on the discreet information it obtains from specific questions, the quality of the narrative may not be adequate to deal with the kind of complexities that occur in criminal cases. The best way to answer that question is to construct a prototype and test it.

V. Conclusions

Our major conclusion is that it is not currently feasible to substantially simulate a face-to-face case-report-preparation session between a police officer and a prosecutor using a micro-computer and commerially available software like BetterBasic. More specifically, it is feasible to develop software that will extract the fixed-format, discreet items of information (such as the names and addresses of the parties involved in the case).

Software programs like ALECS that do this produce police reports that are neater, more compactly organized and more legible than traditional manually-produced reports. But this is a long way from being the equivalent of the kind of report that can be produced by a police officer interviewed/guided by either a prosecutor or a case-preparation unit such as Nashville's.

There are narrower limits to what can be done with a microcomputer than the enthusiasts lead one to believe. Although the computer can be programmed to branch and probe for information, only so many questions can be asked

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before the program becomes tiresome and unfriendly. Moreover, this approach can not eliminate or substantially reduce the need for a free-text narrative of the incident. In fact, if there are too many questions, users will probably be discouraged from writing good narratives. Many of the details would have to be given twice and thus may be seen as tiresome redundancies not worth repeating.

The narrative chronology of the event is an essential source of information for prosecutors and can not be omitted or replaced by a series of answers to specific questions. The narrative provides the primary means by which the prosecutor gets a sense of how the pieces of the puzzle fit together.

Some software currently available, such as certain computer-assisted telephone interviewing programs, has the capacity to generate chronological narrative accounts of events based upon answers given to specific questions. However, its application to a situation as complex and variable as that involved in the reporting of criminal cases from police to prosecutors has not yet been demonstrated. Serious consideration should be given to funding the development and testing of a prototype of such a system. However, given our experience with trying to identify all the right questions and to find language sufficiently generic to fit them, we would warn that constructing an adequate version of such a system would be an enormous task.

Of course it should be remembered that even if software is developed that would extract information from the police and generate narrative as well as fixed-format sections of reports, there are still other problems in the communication process between police and prosecutors that can not be solved by improving the technology of communication.

Prosecutors will still be suspicious of the credibility of the reports of certain police officers who they have come to distrust. The motivation among police to transmit the most complete report possible may remain unchanged. Police memories will fade and the quality of police reports will suffer if the police do not make their reports as close to the incident as possible. (Some prosecutors believe that this should be done in the field at the crime scene and immediately after arrest.)

Notwithstanding these qualifications, however, police reports produced with the assistance of the computer will be accepted by prosecutors as an important improvement over handwritten reports. Most importantly, in some cases depending upon the fact-pattern involved, such reports will have a significant influence on the prosecutors' estimates of the quality of case preparation and the probable disposition of the case. Sometimes computer-assisted reports will make the cases seem stronger than they would otherwise have seemed; and sometimes, weaker. Inasmuch as information is neutral with respective to guilt or innocence, such an outcome is in keeping with the interests of justice.

It is technically feasible to produce an expert system that will select criminal charges based on a literal reading of the penal code; but the usefulness of such a system remains to demonstrated. A system that selects all relevant charges based on a literal reading of the penal code would please the police but would not be in keeping with professional standards regarding proper charging. A system that incorporates a local prosecutor's policies of downgrading or rejecting charges in certain cases will involve substantial political risks for the prosecutor. A system that weighs case strength as one of the criteria for case acceptance has yet to be developed. It seems feasible but it may have to rely on police judgments about case strength which could prove unreliable.

One of the crucial functions of the police is to gather information and transmit it to the prosecutors for disposition decisions. Prior research supports the working hypothesis that greater amounts of information in the police reports results in cases being more likely to be resolved on their merits. In effect this means that they are more likely to reach a more severe disposition than might otherwise have occurred. Thus the police should be required to have the skills and technology appropriate to this crucial function. They should be able to type and should have data processing equipment and software to support this function. Moreover, their personal evaluations should be based in part upon the quality of their performance of these skills.

Attrition rates either for individual officers or for departments as a whole are inappropriate measures of police performance relative to the

prosecution of cases. The more appropriate measure is the quality of case preparation. However, instruments for measuring the quality of case preparation have not yet been perfected. Before police performance from the point of view of the prosecutor can become subject to quality control, these instruments will have to be further refined.

CHAPTER 2

MEASURING POLICEWORK FROM A PROSECUTION PERSPECTIVE

I. Introduction

Traditionally the police regarded their responsibility for criminal cases as ending with arrest. The subsequent disposition of the case was seen as strictly the responsibility of the prosecutors and the courts. Therefore, the police have never measured their performance in terms of what happened to cases after they had been arrested and/or cleared.

This tradition has been changing. Some police leaders are now saying that the police must be concerned about the post-arrest outcome of the case (National Advisory Commission, 1976). Also, research initiatives have been exploring the extent to which the quality of policework is responsible for what happens to the case after arrest (Cannavale and Falcon, 1976; Petersilia, 1976; Knudten et al., 1979; Forst et al., 1981; McDonald et al., 1981; McElroy et al., 1981; Feeney et al., 1983). Among the current six NIJ-funded studies of which ours is a part, the central theme is police responsibility for case disposition.

This development has raised difficult questions about how to measure the impact of policework on case dispositions. The practical problem for both the researcher and the police executive bent on rewarding "good" policework lies in choosing appropriate independent and dependent variables. That is, what measurable aspects of policework should be regarded as the crucial aspects that make a "good" case; and, how does one determine that the best possible policework has been done in a case?

So far the trend has been to measure the quality of policework in terms of the quantity of information contained in the police case reports (Petersilia, 1976; Forst et al., 1977; Knudten et al., 1979; Domash et al., 1980; Forst et al., 1981; Feeney et al., 1981). The dependent variable (that is, whether the case was as strong as the police had it within their control to make it) has usually been measured in terms of the actual dispositions of cases (Petersilia, 1976; Forst et al., 1977; Forst et al., 1981; Feeney et al., 1981; McElroy et al., 1981).

Both of these measures are problematic and should be the subject of future research to refine them, if a system of rewarding good policework from the perspective of the prosecutor is ever to be institutionalized. The problems with these measures are discussed below and an alternative measure of the dependent variable is presented. Instead of using attrition patterns for police units as a whole or conviction rates of individual officers, we recommend using prosecutors to score the quality of information contained in police reports according to some standardized evaluation instrument.

This method was used in our evaluation of the computer-assisted case reports produced by our current project. We believe the method holds promise for wider application in this area of policework. If perfected and standardized, it could lay the basis for an institutionalized means of scoring the quality of policework from the prosecutor's perspective.

We first address the problems of using case attrition as a measure of the quality of policework. We then turn to our alternative and to the problems of measuring the quality of information in the police report.

II. The Meaning of Case Attrition

A. Normative Dimensions

The assumption that existing rates of case attrition are too high or in some sense inappropriate bears careful examination. A distinction needs to be made between the limited sense in which this can be usefully regarded as true, and the larger sense in which it masks an area of criminal justice policy that is complex, anomic and subject to dispute. A close examination of this concept of inappropriate case attrition is particularly critical for research programs attempting to remedy the police contribution to it.

Many aspects of the case disposition process are points of disagreement among commentators and practitioners.

What should the threshold-level of evidentiary case strength that should
be required for admitting a criminal case into the court system (mere probable
cause or something approaching beyond a reasonable doubt)? Should the
standard be the same for all crimes/criminals or should lower standards be
used in more serious cases?

To what extent should standards other than merely legal ones be used in
admitting and disposing of cases. For example, should certain common types
of incidents (such as "barroom-brawl-homicides" or "domestic disputes") be
routinely disposed of as minor crimes? If so, how are those incidents to be
defined?

Who should do the post-arrest-pre-court-filing screening of cases for
admission into the court system (the victim, the police, the prosecutor, the
judicial officer, the court clerk)? How far should cases be allowed to
proceed beyond arrest before they are rigorously screened? Should this be
done at the police station within a few hours of arrest or at the courthouse
within a few hours, or days, or weeks. Should it occur at the initial appea-
rance, the preliminary hearing, the grand jury, the preparation for trial,
or at some special screening meeting with the prosecutor, or not at all?

How many and what degree of criminal charges should be used in cases,
the maximum allowed by law or something else? If something else, what?
Should the initial charges filed be the charges to which cases of that type
usually plead guilty? Should "overcharging" be eliminated? What constitutes
"overcharging"? What constitutes the charging decision? Is it the initial

charges recorded by the police, the initial charges approved by the court issuing the warrant/complaint, the initial charges requested by the prosecutor, or the formal charges listed in the indictment or information? Should plea bargaining be eliminated or restricted in some way? If so, how?

B. The Ambiguity of Standards

This litany of points of dispute about how case attrition should be handled ought to warn analysts against uncritical adoption of the concept of "inappropriate case attrition". It is not that there is a total absence of standards regarding these matters. Some standards do exist. Professional associations (such as the American Bar Association (ABA) and the National District Attorneys' Association (NDAA)) and government commissions have recommended some standards. But for various reasons these standards have not resolved the issues or precipitated a consensus.

The standards themselves are ambiguous on certain points (e.g. on what constitutes "overcharging", see McDonald, 1985) and disagree on others (e.g. whether plea bargaining should be allowed). Moreover, consensus has been prevented by the great diversity among local jurisdictions in the ways they have organized their criminal justice process.

Local history, differences in physical size, crime problems, laws, politics and other factors have produced enormous variability in the social organization of the criminal justice case processing system. These differences make national standards seem like remote ideals, easy to ignore and politically difficult and risky to try to implement. When local

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prosecutors have attempted to implement certain national standards they have

met strong opposition.[1] Other prosecutors have been reluctant to enter the

battle. Still others have yet to agree that early case screening is a

critical part of the role of prosecutor (Jacoby, 1980).

C. The Relativity of Standards

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[1]. One standard that has enjoyed fairly consistent support
since the 1920's is that case screening should be done by the
prosecutor as early as possible in the process and the threshold
standard for case acceptance should be high in order to conserve
the limited court resources for stronger and more serious cases.
During the 1970's the National Institute of Justice's predecessor,
the National Institute of Law Enforcement and Criminal Justice
(NILECJ) sponsored numerous early case screening programs in line
with this standard.

Despite this support prosecutors who have attempted to
implement such programs have had major political obstacles to
overcome. One of the strongest sources of opposition has been the
police. Ironically, even when one prosecutor's office set out to
eliminate plea bargaining (a practice which the police universally
complain about), the police objected. (For accounts of police-
prosecutor struggles over implementing rigorous screening policies
see generally, McDonald,1979; McDonald et al., 1981; and
McDonald, 1985.)

The main justification for early case screening is simple
efficiency. Weak and trivial cases that probably would have been
dropped or reduced for pleas to minor offenses can be quickly
eliminated. The enormous savings of such screening have been
amply demonstrated. For instance, such a program in Philadelphia
found that 41% of 20,000 arrests could have been immediately
eliminated from the system (Savitz, 1975:262). In Chicago the
prosecutor's review unit concluded that "crimes had not been
committed" in 41% of the murder cases brought by the police and
95% of the armed robberies, 87% of the forcible rapes, and 97% of
the aggravated robberies (McIntyre and Nimmer, 1973:20).

Nevertheless, efficiency is not the value that everyone thinks
should be maximized. Many police and others would prefer to see
weak and trivial cases allowed into the court system and pursued
for whatever can be gotten. A plea to a minor offense is better
than none at all; and even if the case is dismissed, the offender
has been inconvenienced.

This diversity means that comparisons of case attrition patterns among different jurisdictions is problematic at best. Ultimately, the lack of standards and the existence of the wide diversity in practice means that there is no way of saying that a particular pattern of case attrition is good, bad or indifferent in some universally accepted sense.

Statements such as the one with which we opened this discussion, namely that "case attrition rates seem high," are meaningless if used in an absolute sense. Unlike other areas of the law (such as the requirement of equal protection and the exclusion of inappropriate considerations in decisionmaking) there is no absolute standard against which patterns of attrition can be measured. All patterns of attrition must be measured relative to some policy objective. Thus, a particular pattern may be regarded as "appropriate" or "inappropriate", "high" or "low" depending upon one's policy objectives.

Consequently, if one could compare two hypothetical jurisdictions which were identical in all respects except their patterns of attrition, it would not be meaningful to say that one pattern was better or worse than the other except relative to the policy objectives of the local officials. Then, of course, one still must decide which of the local officials' policy objectives should be used. Jacoby (1977) suggests that it should be the prosecutor's (but local police and others may well disagree).

This relativity of standards means that inappropriate case attrition must also be measured in relative terms. That is, a case may be considered

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to have been inappropriately disposed if it is disposed of differently than preferred by local policy. Hence, police responsibility for inappropriate dispositions refers to those instances where cases reached dispositions other than the ones preferred by local policy because of actions which the police could have done differently.

III. An Alternative Approach

A. Previous Research

The implications of the foregoing discussion for studies of the police responsibility for case attrition are critical. The problem is to find ways of linking differences in police work to differences in patterns of case attrition while controlling for all the other confounding factors that may determine the pattern of case attrition.

Researchers concerned with police responsibility for inappropriate case attrition have varied in the extent to which they have controlled for the confounding effects of differences in local policy. The least degree of control was achieved in comparisons between different local jurisdictions in different states (e.g. Feeney et al's (1983) comparison of San Diego, California and Jacksonville, Florida) and even between different local jurisdictions within the same state (see e.g. Petersilia, 1976). Greater control was achieved by evaluations of programs designed to reduce inappropriate case attrition due to police error where before-and-after measures of matched, experimental and control police precincts were used (McElroy et al, 1981).

More generally, the problem is one of finding some meaningful way of measuring the quality of policework from the perspective of the prosecutor. Forst et al. (1977) have used the concept of arrests that result in conviction; but it has many of the same problems as using the general pattern of attrition. Factors other than the quality of policework may account for the differences among individual officers in their arrest-convictability rates.

Given the problems of the noncomparability of attrition patterns among different jurisdictions and the difficulty of obtaining truly matched precincts, we recommend that an alternative approach be considered. Instead of (or in conjuction with) using attrition patterns or individual police officer arrest-convictability scores, a surrogate measure which is much less subject to extraneous confounding influences should be used.

The quality of case reports produced by individual officers should be reviewed by persons experienced in prosecution using a standardized set of questions intended to rate the case from the point of view of the prosecutor. In other words, we propose that the appropriate measure of the quality of policework-from-the-point-of-view-of-the-prosecutor is the quality of information contained in the police report. After all, it is the quality of this information that is the one thing that the police can (partially) control that in turn influences (but does not necessarily determine) what the prosecutor will do with the case.

Rating the quality of information in police reports presents problems of its own. How should "quality of information" be defined? Should it be simply the amount of information or the accuracy of information or more information of a particular kind? Two approaches have been used.

One was simply to count the presence or absence of specific items and to sum to an overall score (e.g. Petersilia, 1973). But, that raises problems of how to count missing items when the items are not expected to be present (e.g., the report contains not information about a weapon used because no weapon was used) (McDonald et al., 1981).

A second approach is one we adopted in the present study and recommend for further refinement. It builds upon the work of Domash and associates (1980). In their evaluation of the Case Preparation Unit of the Nashville Police Department, they developed two measures of the quality of police case reports. In one they scored the percentage of case elements (i.e. the legal elements necessary for prosecution) that were documented in the case reports.

This was done by consulting a checklist of case elements for 11 felonies (adapted from the Tennessee Code Annotated). Comparisons were then made between samples of case reports produced before and after the inauguration of the Case Preparation Unit. Significant improvements in the documentation of case elements were found. (The rates of documentation jumped from between 40%-60% to between 96%-98%.) Secondly, they had prosecutors rate various aspects of the quality of case preparation.

The advantages of this approach over the counting of items of information contained in the police report are that it avoids the problem of counting missing-but-not-relevant information and its units of analysis (legal elements) are more directly related to purpose of measuring case strength. The main disadvantage is that it somewhat less objective than other approach. The question of whether a legal element is present or not involves some judgment. It is not synonymous with the presence of an item of information. However, the reliability of these judgment calls could be checked and one would expect that for general comparative purposes it should be reasonably high.

B. Our Approach

Our approach to measuring the quality of case preparation and its impact on disposition was to use prosecutors to evaluate the case reports and to indicate what they thought the disposition of the case would be if it proceeded through normal channels in Nashville. We used Likert-type scales and Osgood Semantic Differential-type scales (Babbie, 1986).

That part of the evaluation sheet which asked prosecutors to rate the quality of the case preparation built upon the work of Domash and associates (1981). The second part of the sheet which asked prosecutors to estimate the likely case disposition was modeled on our own previous work (McDonald, 1985) on prosecutorial decisionmaking and that of others particularly Jacoby (1980).

Some of the questions on our evaluation sheet are specifically tailored to the crime of burglary (which was the only crime that the prosecutors would be evaluating). This restriction could be removed if this instrument were to become the basis for a general-purpose "information quality control check" to be used in the future for this purpose.[2]

Prosecutors were directed to read the attached police report and to respond to the specific questions asked on the evaluation sheet. The trickiest part of crafting this instrument was in trying to restrict the scope of what the prosecutors were going to evaluate. We did not want them to evaluate the overall investigative effort in the case. Rather, we wanted them to focus on the quality of the communication from the police about what happened in the case.

This distinction between what happened in the case and how well the police describe what happened in the case is, of course, not an easy one to maintain in practice. Nevertheless, it is the latter that is the primary interest of our project and must be the focus of any efforts to evaluate the quality of case-related communications from the police.

Prosecutors were asked for ratings of 1 to 7 of the extent to which the police report provided them with information required to reach sound judgments about each of the following legal/factual issues: (1) whether defendant had an intent to commit a felony within the premises; (2) whether an actual

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[2]. See Technical Appendix for a copy of the Case Preparation Evaluation Form.

breaking and entering occurred; (3) whether the defendant was unlawfully upon the premises; (4) whether the report establishes the sufficiency of the Miranda warnings; (5) whether the report establishes the legality of any searches; (6) whether the report establishes eyewitness testimony linking the defendant to the crime; (7) whether the report establishes physical evidence linking the defendant to the crime; and (8) how well or poorly the report was prepared overall.

These questions were developed by asking Nashville prosecutors to identify the most crucial legal elements and other items of information in burglary cases that they need to have addressed. Other questions might be developed for other crimes.

Prosecutors were also asked to rate the cases along four continua: comprehensive-minimal; weak-strong; serious-trivial; and understandable-confusing. They were also asked how much more information they would seek from the police officer who prepared the case if they had the opportunity to speak to him/her. This answer was scored from "none" (0) to "a lot" (7).

They were then asked what the most probable disposition of the case would be in Nashville; what would be the most lenient plea offer that would probably be given (if one were given); what the probability of conviction of the case would be if it were normally prosecuted in Nashville; how confident they were of their estimate of the probability of conviction; and how serious

they rated the case compared to a burglary of a residence in which no one was home and property worth about $50 was stolen.[3]

III. Conclusion

In keeping with the current movement to find ways to reward high quality policework from the point of view of the prosecutor, we propose that research be done to more fully develop, test and refine the types of instruments that we and Domash and associates have used. Conceivably, it may be possible to develop an information auditing/rating system that might be applied at the level of individual officers or of larger police units (precincts, divisions, or whole departments) to assess the quality of their work from the point of view of prosecution.

We believe that an information evaluation instrument of the kind we have described would be a more appropriate method of measuring this aspect of policework than alternative measures such as actual conviction rates (or related attrition rates) because of the numerous confounding factors involved in the latter.

In our experience and that of others (Jacoby, 1980; Domash et al. 1981), instruments such as the ones we have described can have face validity and a

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[3]. For the results of the analysis of this data see Chapter 6.

high degree of reliability. Thus they hold considerable promise. However, their potential value should not be overestimated or casually assumed. There are limitations which must be addressed and overcome in future refinements.

The primary limitation of any method of measuring the quality of case preparation of individual police officers is that the great majority of case files contain the reports of more than one police officer. A typical case file contains the reports of at least two officers, the patrol officer who responded to the person who reported the incident and the detective-/-investigator who did the subsequent work in the case when an arrest was made. Frequently there are several other officers contributing supplemental and other special reports such as identification unit reports or affidavits in support of arrest warrants.

It obviously would not be appropriate to rate the quality of work done by a given police officer based on an overall rating of a file that contained reports that he/she did not produce. This problem is mitigated but not eliminated if one shifts ones unit of analysis from individual officers to large police units. These complications will take additional research and testing to be resolved. Nevertheless the prospect of devising a method of structuring police concern for the enhancing the prosecutability of cases seems worth it.

CHAPTER 3

COMMUNICATION AND THE CRIMINAL JUSTICE PROCESS

Facts are guesses

- - Jerome Frank

I. The Problem of Communication

A. Ambiguity

Human communication is at once amazingly easy and amazingly difficult.

People communicate with each other everyday in a thousand successful ways.

"Pass the salt" and the salt gets passed. Seems easy! Yet, miscommunications

abound. "Didn't you hear me? I said...." Moreover, all communications

whether accurate or inaccurate carry more than one meaning. There is the

manifest message: "Pass the salt" (I need it for my meat). Then there are

the meta-messages, the possible connotations and innuendoes: "Pass the salt"

(you inconsiderate hog with all the condiments at your end of the table).

These meta-messages often rely for their expression on dimensions of the

communication other than the mere words spoken, such as tone of voice. An

additional complication is that the meaning of the exact same words can

change with the social context in which they are spoken. "Pass the salt"

means something different in the context of a doctor-patient relationship

where the patient is on a low-sodium diet and has delivered a specimen for urinalysis. Yet another complication is that some communications are not intended to tell the whole truth or even part of it. Human communication is so problematic and rich in complexity that an entire discipline, linguistics, is devoted to understanding this basic human process.

To the man-on-the-street daily communication is largely unproblematic. When errors occur they are usually of little consequence. But in certain social enterprises accurate communication is critical. Errors, omissions and distortions can have highly significant consequences. The criminal justice system is one such enterprise. In deciding the guilt or innocence of a defendant the law wants "the truth, the whole truth and nothing but the truth." By extension the same high standard of accurate communication applies as well to cases disposed of prior to trial through pleas, dismissals, rejections and diversions.

In theory, the criminal trial with its adversary process is supposed to assure that the "truth will out" and that the factfinders (the jury or the judge) will be able to determine whether the defendant is indeed guilty based on the facts presented. But the process of human communication through which these facts are transmitted is so fraught with bias, and distortion that Jerome Frank (1949) argues that these facts are really nothing more than guesses. He counsels an attitude of "fact skepticism". Justice decision-makers do not "find" facts. They "make" them.

In reality most cases are not disposed of by an adversary process at trial but through an administrative process in which the prosecutor is the key decisionmaker. The facts about a case which prosecutors want to know are those which permit them to reach conclusions about the following four dimensions of a case: the seriousness of the crime; the strength of the evidence; the seriousness of the criminal; and any circumstances requiring that the case be treated differently than it would normally merit (McDonald, 1985).

Each of these four dimensions represents a professional judgment-call based on the interpretation of "facts". The dimension is a global unit that is not reducible to any of the facts upon which it is based. For instance, the conclusion that the defendant is a serious criminal is heavily influenced by but not synonymous with the defendant's prior record. Any given prior record must still be interpreted. Two prior robbery arrests could mean the defendant is a serious threat to the community. But if both arrests were dismissed and if both had been made by Officer Jones who is reputed to be making bad arrests in his effort to bolster his arrest record, then maybe the defendant is not so dangerous after all.

Notice that we have distinguished between "the facts" and the "dimensions" of a case. This allows us to extend Jerome Frank's insight about facts being guesses. In order to hint at degree of the complexity and uncertainty involved in the prosecutor's decisionmaking, we distinguish between what we will call first-order guesses and second-order guesses. The conclusions that the prosecutor draws about the dimensions of a case (e.g. whether

it is weak or not) are second-order guesses based on "facts" which are first-—order guesses. That is, the "facts" that the prosecutor uses are somebody else's guesses.

More generally, the whole communication process that links justice decisionmakers with the persons, places and events they must decide about consists of a series of mini-communication systems in which one man's conclusions are the next man's facts and both the conclusions and the facts are guesses. One can trace this sequence back to its original source searching in vain for bedrock facts.

The prosecutor's conclusions are based on the "facts" reported by the police officer. But to the police officer those "facts" are conclusions he drew about the crime based on the "facts" reported by the witnesses; but the "facts" known to the witnesses are really conclusions which the witness drew about what he thought he heard and saw. Experiments showing the inaccuracy of eye witness memories have long since established that even the observers who are closest to the original incident can not be thought of as establishing "the facts" (in the sense of a completely accurate description of what act-ually happened) (see generally, Marshall, 1969). Nevertheless, the "facts" reported by the witnesses, defendants and other parties involved in a case will become the nominal or alleged facts which decisionmakers will have to use to interpret what happened. Their conclusions become the official version of the "real" facts of the case.

The hope is that the official version of the real facts does not depart in any significant way from the actual version, which, of course we can never know. The law of evidence and the adversarial trial process are legal safeguards designed to minimize such departures. But those safeguards only operate for the few cases that go to trial. For the vast majority of cases whose dispositions are decided administratively at some pretrial stage, one of the main safeguards against inappropriate case dispositions is the quality of the communication system through which the prosecutor learns about the persons, places and events involved.

B. Police-Prosecutor Communication Channels

Jurisdictions differ significantly in the number, kind and quality of communication channels they provide for the prosecutor. The two basic kinds of channels are the written document and the verbal report of a knowledgeable party such as a witness or police officer. Each type of channel has its advantages and disadvantages. The written report can be written at the convenience of the author and read at the convenience of the prosecutor. It can be formatted to systematically collect the same items of information for all cases. It can be stored and retrieved; reproduced and distributed; counted and added to. But the written report is tedious to write; requires good spelling, penmanship and legibility; may not reproduce clearly; and does not allow the reader to probe the author for clarifications, omissions, meta-messages or indications of the author's veracity or persuasiveness as a witness.

Verbal reports made between the police officer or witness and the pros-
ecutor in a face-to-face interaction are easier to give and they afford the
prosecutor much greater opportunity to learn more about the case, to probe
for all the detail and nuance that he feels he needs. But the verbal report
is labor-intensive; costly; difficult to schedule; less systematic and re-
liable; and immediately lost (unless transcribed into hardcopy).

Ideally, in order to meet the whole-truth standard, prosecutors should
have available to them both high quality written reports and the opportunity
to question the relevant parties directly. Some jurisdictions have this. The
prosecutor meets with the police officers and the victims and witnesses
shortly after arrest. He reviews the police reports; interviews the people;
makes his decision as to whether to proceed and on what charges; and then
fills out his own report. In other jurisdictions prosecutors must make do
with much less opportunity to get at the whole truth.

C. Sources of Communication Breakdown

The underlying technology that police and prosecutors operate in common
is that of information processing. In oversimplified terms, the police act
as data gatherers and transmitters to prosecutors who are the decisionmakers.
Yet this critical task of the police has never received the recognition and
emphasis it deserves. It is hard for the prosaic image of information proces-
sor to compete with the romantic image of law enforcer. Little in police
culture, training, or reward structure emphasizes the information processor
function. Indeed there is a classic mismatch between training and reality.
All police officers receive some training in the use of firearms. Yet many

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never use their weapon for years on end. In contrast, virtually no police departments require that officers learn how to use a typewriter. Yet, officers fill out reports by the score.

The police neglect of typing skills is part of a larger blindspot in the traditional police definition of their role. They have always held that their responsibility for a case ends at arrest. As soon as one case has been made (i.e. the defendant arrested) they want to move on to the next one, like the fisherman who is more intrigued by the sport of fishing than the art of cooking fish. They do not see themselves as scribes or communication channels between the crime, the criminal, the arrest and the prosecutors. For various reasons they do not worry about what the prosecutor needs to know about a case.

They are not exactly sure what it is that he needs to know. They do not get the right kind of feedback on the consequences of providing or not providing certain information. They can remember the time they wrote something in a report that came back to haunt them, something that became the opening wedge for the defense to learn about something the officer did not want him to know. They resent prosecutors with loose lips who would reveal the entire case to the defense if you put everything in the report. They get no "atta- -boys" for well-prepared reports or demerits for cases the reach dispositions that might have been different had the case information been more or less thorough. They figure that the quality of case information could hardly make any difference because most cases are dropped or plea bargained. But, most of all, they simply do not see it as their job. Why do the "prosecutor's

work" for him! He's got investigators and subpoena power. Let him get what

he needs. Anyhow, he always wants more information than is reasonable to

expect.

Some of these views are reflected in the parting shot of a retiring

police chief, a veteran of 34 years of policing, whose broadside was entitled,

"Our Judicial System Is A Mockery." He wrote:

> During the initial on-scene investigations, additional person-
> nel are not available to solve crimes as easily as shown on those
> television programs. In actual practice the officers must do the
> best they can with the available facts and whatever else they may
> be able to uncover between assignments. Certainly the cases cannot
> be solved as meticulously as the courts, in their sterile environ-
> ment, want -- as desirable as that may be.

> The court system makes these demands while making it difficult
> or impossible to obtain evidence to fulfill their demands. Pros-
> ecutors want the ideal case, but the "school" solution is seldom
> attainable in the streets. The police officer must deal with the
> facts that are available -- **legally** available. Frequently,
> these facts are elusive and are lost with time.

> The good prosecutor should be able to help the officer streng-
> then the case and then demonstrate his ability to successfully
> **prosecute**, not "wheel and deal," as is often the case, to avoid a
> long trial. (Bishop, 1983).

Chief Bishop's remarks typify the traditional police view of case attri-

tion (see McDonald et al., 1981). The ideology is that prosecutors "wheel

and deal" because of some less-than-professional quality in prosecutors not

because of anything the police fail to do. It is not that prosecutors have

to reject, dismiss or plea negotiate cases because the evidence is weak or

inadmissible because of some due process violation. Rather, they do so

because they are lazy, inept or protecting their "track records". In con-

trast,prosecutors contend that to some (unspecified) extent the pattern of

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case attrition is due to the police failure to supply the necessary admissible evidence to support the appropriate dispositions.

The prosecutors' critique has two parts. On the one hand it is that the police fail to obtain the evidence (don't dust for prints; don't interrogate all the witnesses; don't ask all the right questions). On the other hand, it is that the police do not communicate to the prosecutors all the evidence they have obtained. Most of the reasons for this latter breakdown have already been mentioned. But one bares elaboration.

The police do not tell the prosecutor about things they do not realize he needs to know. The most frequently cited example of this was the defendant's false exculpatory statements. Prosecutors everywhere report that the police frequently fail to mention that the defendant gave them some alibi, for instance that he was somewhere else at the time of the crime. Such statements could be of considerable value to the prosecutor especially if the alibi had been checked out and found to be false. The statement could give the prosecutor a tactical advantage in plea negotiations or trial. At trial it might prevent the defendant from taking the witness stand. Or, it might be used in cross-examination to find inconsistencies in his story.

Another aspect of the prosecutor's information needs that the police do not appreciate (or, more correctly, misinterpret) is the need for redundancy. Many things can go wrong with a case between arrest and disposition. Witnesses can die, disappear or forget. Evidence can be lost, suppressed or destroyed. Confessions can be recanted and claimed to have been coerced.

Consequently, from a prosecution point of view all angles in a case should be prepared as thoroughly as possible so that if one approach falls through another will be able to carry the proof.

From the police perspective, however, this strategy is seen as asking that the case be "over-prepared". It is interpreted as an unreasonable demand for the "ideal" case. For the police, redundancy means extra work that is not seen as serving any useful purpose. Most cases are going to be settled without trial anyway. So, what difference does it make if you get the additional information.

A third aspect of the prosecutor's information needs that the police do not fully appreciate is the level of detail needed. The difference between a strong case and a weak one is frequently just a matter of the degree to which the police transmit the specific and legally-relevant details that they do in fact obtain in the case. Here the problem is not a matter of the police deliberately withholding information or not knowing the legal elements of the crime. Rather it is a matter of not realizing how much of a difference nuance and fine detail can make to the "guesswork" of prosecution and adjudication.

D. The Social Construction of the Case Disposition

The police like everyone (except prosecutors, defense attorney and linguists) overestimate the ease and accuracy of communication and underestimate all the potential ambiguities (especially when one of the parties to the communication [the defense attorney] has the duty to search out and

exaggerate any potential ambiguity). Also, like everyone else, the police do not appreciate the amount of "guesswork" (more euphemistically referred to as "professional judgment") involved in prosecution.

When a prosecutor accepts, rejects, dismisses or plea bargains a case, he is making a statement about his estimate of the probable outcome of an immensely complicated set of contingencies that might happen if the case went to jury trial. The number of contingencies are mind-boggling, far more than the human mind can intelligently weigh and balance at one time.

In practice all of these probabilities are summed up as one overall estimate, the likelihood of conviction at a hypothetical jury trial. What this involves in any given case is the probability that some unknown jury with all of its prejudices, a jury that is (usually) not even picked and whose composition would depend upon the outcome of the voir dire which in turn depends upon the skills of the attorneys involved plus the luck of the particular draw from the pool of potential jurors plus the legal proclivities of some yet-to-be-assigned judge; sitting before that yet-to-be-assigned judge who has certain tendencies about how he will allow the trial to be conducted and what instructions he will read to the jury; and before some defense attorney (who may not yet be assigned) with a certain level of skill; and before some prosecutor (who may not yet be assigned) with some level of skill; and operating in some climate of public opinion which may suddenly change in favor or against the particular type of crime or criminal because of some unexpected, highly visible event such as a celebrated crime, or a police scandal or a moral crusade, would unanimously find that the

evidence against this particular defendant supports a verdict of guilt beyond a reasonable doubt.

It is this very human and highly probabilistic nature of the adjudication process that Oliver Wendell Holmes, Jr. had in mind when he wrote his famous definition. "Law," he said, "is not a brooding omnipresence in the sky.....[A] legal duty so called is nothing but a prediction that if a man does or omits certain things he will be made to suffer in this or that way by judgment of a court....The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by the law" (Schur, 1968: 44).

To paraphrase Holmes, it is the prosecutor's prophecy of what some jury will do that largely determines case disposition ("law", in Holmes's terms). These prophecies become all the more
problematic when one learns how prosecutors "know" what juries are likely to do in certain kinds of cases. Remember that jury trials are rare events compared to the overwhelming proportion of cases that are disposed of without jury trials. So it is not as if the prosecutors in an office (either collectively or individually) have a lot of experience with juries upon which to base their estimates of what juries are likely to do. Not only is their experience-base limited but there is good reason to believe that it is also skewed. Cases that go to trial can not be assumed to be like cases that reach non-trial dispositions.

Thus the prosecutor's estimate of the probability of conviction represents an act of creative imagination in which he extrapolates from a limited

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and skewed experience-base to what a hypothetical jury would do. Moreover, this estimation process is subject to the moral editing of the prosecutor. If he does not approve of what he thinks the jury will do, he substitutes his own standards. A prosecutor in one mid-Atlantic jurisdiction justified plea bargaining in rape cases on the grounds that local juries "refused to convict" rape cases.

In practice what often happens is that one jury trial sets what is considered to be "the norm" for what local juries will do. This one group of twelve people who were chosen through the selection biases of the voir dire from a pool of citizens that is itself not a representative sample of the whole community comes to be regarded as representing the moral standards of the community. For instance the mid-Atlantic prosecutor based his rather sweeping conclusion on the results on only two cases that had gone to jury trial in several years. The more recent case was regarded as confirming that the norm had not yet changed since the last time it had been tested in the prior case which had happened much earlier.

In estimating the probability of conviction a prosecutor will be influenced by the degree of detail in the police report. This is particularly relevant to the process of "fact negotiation", that part of the guesswork wherein prosecutors and defense attorneys argue over what the real facts of the case are, or more precisely, what a hypothetical jury would be likely to conclude the real facts are. The greater the detail in the police report, the smaller is the zone for fact negotiation.

Consider the following three versions of a report of the same incident. The first simply says there is a witness to the crime. The second says the witness saw the defendant coming out the window. The third says the witness was ten feet away; under a bright light;with an unobstructed vision and remembers that the defendant tore his shirt when he came out of the window. Obviously, version three leaves much less room to argue over how convincing that witness would be to a jury. In contrast, version one leaves the door wide open for the defense attorney to raise doubts about whether the state's key witness will be very convincing. Not knowing how convincing a witness he has, the prosecutor will feel more inclined to plea bargain if he had not intended to, or willing to give a large plea concession than he intended.

II. Information and the Pattern of Case Attrition

A. The Impact of Information

It is important to point out what the relationship is between the quality of case preparation and the pattern of case attrition. In theory, information is neutral. More information does not necessarily mean that the case will be stronger and more likely to result in conviction. It might just as likely reveal some weaknesses in the case or the innocence of the defendant. Indeed, as mentioned earlier, the police are not always forthcoming with their information to prevent the discovery of certain things such as improper searches that might subvert a case.

In reality, however, better prepared reports should generally mean stronger cases (everything else being equal). This is so because the selec-

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tion of defendants for arrest and prosecution is not done by random chance. It is biased in the direction of picking people for whom some information already exists that they are factually guilty (i.e. they actually did the act that violated the law). As best we know, the end product of this selective process is highly accurate. Compared to the total number of persons convicted in this country, the number of factually innocent defendants who have been discovered to have been wrongly convicted is minuscule.

Stronger cases, however, do not necessarily mean a greater number of trials or convictions. Indeed, cases might be made stronger by some innovation and the pattern of case attrition may not change at all. The same percentages of incoming cases (controlling for type of crime) may be rejected, dismissed, plea bargained, tried and acquitted. Nevertheless, important albeit less visible and quantifiable changes may have occurred. The mix of cases in the post-innovation pattern may differ from what it would have been but for the innovation. Whereas burglaries x,y,z might have been dismissed under the pre-innovation system. They may now be plea bargained and a different three cases dismissed. Yet from the net change it would appear as though the innovation had no impact.

The relationship between the general level of case preparation of cases entering a court system and that system's pattern of case attrition is not well known. Moreover, there are many factors other than quality of case preparation that determine the patterns of attrition for various types of crimes. Among those are the policies of the police and the prosecutor. Certain types of crimes are usually going to be dismissed or

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plea bargained no matter how thorough the police report. Domestic and neighborhood disputes are frequently dropped; crimes between people who know each other are frequently reduced and plea bargained; in big cities, commercial burglaries are reduced to misdemeanors. Improving the quality of case information in those cases may not have any impact or, at best, may convert some would-be dismissals in to guilty pleas.

B. Literature Review

For our purposes, case preparation has two distinct meanings. The first refers to how well the police investigate a case. The second, to how well they communicate to the prosecutor what their investigation consisted of and what it revealed. The prosecutor needs to know not only what information was obtained but also whether it was obtained lawfully; what degree of credibility it has; and what leads might yield more knowledge. For convenience the first aspect of the case preparation can be called the "investigation" and the second, the "reporting" of the case. Our project is designed to directly improve the reporting process and indirectly (as a result of officers anticipating the questions that the computer would ask them) improve the investigation process.

The available research on the relationship between case preparation and the pattern of case attrition is limited to a few studies of varying degrees of rigor; and, the studies do not always allow one to distinguish between faults in the investigation from faults in the reporting of cases.

A Dallas Police Department study estimated that "police error" was responsible for 14% of the local grand jury "no bills"[1] and 6.4% of the felony dismissals (National Institute of Law Enforcement and Criminal Justice, 1979:9). Unfortunately, neither "police error" nor the method used to determine whether a dismissal was due to police error were defined. (It is believed that these judgments were made by police officers.) When a case review unit (called the "Police Legal Liaison" program) staffed by attorneys was inaugurated (with federal funding), the attrition due to police error dropped to 4.3% of the no-bills and 2.6% of the dismissals. However, it is hard to tell whether this improvement was due to improved investigation, improved reporting or simply weak cases being screened out by this new review unit.

In Nashville, Tennessee a case enhancement unit (called the "Case Preparation Unit")* used legally trained assistants to help police officers prepare especially designed case report forms intended to benefit the prosecutor including a typed narrative account of the cases. Obviously, this project was aimed at improving the quality of the **reporting** process. An evaluation found that it succeeded but the evaluation did not link the improved quality of the reports to case dispositions (Domash et al., 1980). Success was measured along several other criteria.

Percentages of case elements documented in report narratives were collected by having a data analyst read narratives and consult a checklist of case elements for 11 felonies to determine the number of elements that were

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1. In Dallas the bulk of the formal charging decisions are made by the grand jury.

documented. This measure showed significant increases in the percentages of elements documented (from 60% and 40% in the baseline condition to 98% and 96% during the test condition). Among the 17 officers who prepared reports under both methods there was an average improvement of 64% (range = 0 to 100%) in the number of case elements documented. When prosecutors were asked to rate samples of cases along eight dimensions of usefulness to the prosecutor, the Case Preparation cases were rated significantly better than the case prepared by the baseline manual method.

McDonald and associates (1979) obtained estimates from prosecutors as to the proportion of cases rejected at initial screening in their jurisdictions due to police error (defined as "bad search, sloppy investigation, incomplete interview, etc."). The estimates among seven prosecutors attending a prosecutor's professional meeting ranged from 5% to 100% with four respondents giving estimates of 50% or above. Other prosecutors in the sixteen jurisdictions visited nationwide attributed widely varying estimates of police responsibility for overall case attrition.

Rand (Petersilia, 1976) established that a relationship exists between the quality of case reporting and the pattern of case attrition; but, due to the small sample size and the inability to control for confounding variables, the relationship must be regarded as suggestive at best.

Samples of robbery case reports from two California jurisdictions were rated in terms of the presence or absence of 39 items of information which prosecutors said they need. The case acceptance standards of the two pros-

ecutors' differed substantially. The prosecutor's office in Jurisdiction A
was extremely strict in screening cases for filing. It only accepted cases
that could be proven to a jury and would not file cases if the basic elements
were missing from the police report or if the facts were not convincing. On
the other hand, once it accepted a case Jurisdiction A was reluctant to plea
bargain it to a lesser charge. The other office (denoted B) was much more
willing to file cases that had been minimally prepared by the police.

The samples consisted of cases that were accepted for prosecution (N for
sample A = 21, for sample B = 22). Given these differences in prosecution
policies any comparison between the two jurisdictions is confounded at the
outset. A difference in the patterns of case attrition between them may be
due in whole or in part to this policy difference. Other potentially con-
founding variables such as status characteristics of the offenders and the
mix of relative seriousness of the robberies involved were also not control-
led.

With these restrictions in mind, the quality of the case reports in the
two jurisdictions can be compared and their apparent link with case attrition
examined. Generally, the police departments in **both** jurisdictions provided
the prosecutors with **less than half** the information that prosecutors said they
needed. But in Jurisdiction A with the strict screening policy, the police
reports were of higher quality than in Jurisdiction B.

Each of the 39 questions was answered on the average in only 45% of the
cases in the A sample and only 26% of the B sample. The police reports filed

in Jurisdiction B were handwritten, difficult to follow, and usually contained
no more than minimal information concerning the case. There were no referen-
ces to any follow-up investigative work. In contrast, the report in Juris-
diction A were typewritten, easy to follow, and contained minute details.
In addition, separate reports documented the activities of the follow-up
investigation in A.

In Jurisdiction A all the cases had follow-up investigations and these
provided the prosecutor with the following:

o Verbatim accounts from more than one person concerning the details
   of the offense.

o Detailed accounts of lineups and mug shot showings.

o Inclusion of information concerning physical evidence recovered.

o Investigator summaries of the cases, often commenting on the quality
   or credibility of a witness, or pointing out inconsistencies in the
   facts.

o Information from the suspect about himself and his relationship to
   the case.

In contrast, there were no follow-up investigations in the sample of B Juris-
diction cases and Rand inferred that the above information was virtually never
presented to the prosecutor.

The difference between the two jurisdictions in the attrition of these
cases is shown in Table 3.1. The difference

Table 3.1

Comparison of Jurisdictions A and B In Dispositions of
Robbery Cases Accepted for Prosecution

Disposition	Jurisdiction	
	A (N=21)	B (N=22)
Dismissed	0.0	22.7
Plead guilty to original charges	61.1	18.2
Plead guilty to original charges but with special allegations stricken or not considered	27.7	22.7
Plead guilty to 2nd degree robbery reduced from 1st degree robbery	5.5	18.1
Plead guilty to other lesser offense	5.5	4.5
Trial by court	0.0	4.5
Trial by jury	0.0	9.0
Total	99.8	99.7

Adapted from Petersilia (1976). Error due to rounding.

is considerable. In Jurisdiction A no cases were dismissed and none went to trial. Moreover, there was little reduction in charges. Except for the striking of the special allegations in exchange for guilty pleas, the majority of Jurisdiction A's guilty pleas were to the original charges. The fact that no cases went to trial may mean that the cases were so well prepared that there were no perceived chance of winning at trial.

In contrast, in Jurisdiction B where police reports are of substantially poorer quality, 23% (5/22) cases were dismissed and 13.5% (3/22) went to trial. The reasons for the dismissals were:

Number of Cases   Reason

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Dismissed

1 .... Absence of indispensable party
1 .... 995 PC (lack of probable cause)
1 .... Prosecution not ready
2 .... 1538.5 PC (wrongful search and
                        seizure).

It is doubtful whether these dismissals could have been avoided by better

police investigation or reporting. But, on the other hand, if the investiga-

tion or reporting had been more thorough maybe these cases would not have

been accepted for prosecution. (Of course, it is equally plausible that the

fault here lies with the prosecutor's indiscriminate acceptance of cases.

Better prepared cases might still have been rejected.)

Also in Jurisdiction B there is considerable instability in the charges.

Comparatively few cases plead guilty to the original charges with no apparent

plea bargaining considerations given (18.2% compared to 61.1%). (Again, we

must admit that this major difference could be due to factors other than

differences in the quality of police reports. It would crucial to know

whether the same pattern of attrition would have occurred if the police

reports from Jurisdiction A were used in Jurisdiction B.)

Forst and associates (1977) found something old and something new in

their analysis of the causes of case attrition. As expected, attrition was

lower when the evidence was stronger. Generally for most crimes the rate of

conviction per 100 arrests increased (usually by a statistically significant

amount) when tangible evidence was recovered, when two or more lay witnesses

were identified and when the crimes were between strangers.

Of 1432 burglary cases tangible evidence was recovered in 54% and two
or more lay witnesses were identified in 46%. The conviction rate for burg-
laries with tangible evidence was significantly higher than those without it
(47% compared to 38%); as was the rate for those with two or more lay wit-
nesses (45% as compared to 38%). Clearly these findings suggest that the
police influence case attrition to the extent that it is within their control
to obtain tangible evidence and lay witnesses.

The new and surprising part of the Forst findings suggests that the
police control over these evidentiary matters is substantial. Contrary to
what one might assume, the presence or absence of tangible evidence and lay
witnesses is not determined solely by the nature of the crime. Rather they
appear to be heavily determined by the efforts of the individual police
officer investigating the case. The arrest of some officers are far more
likely than those of others to result in conviction.

In 1974 only 54% (2,418) of the 4,505 sworn officers who served on the
District of Columbia Metropolitan Police Department (MPD) made arrests. Of
all the MPD officers who made arrests, 31% made no arrests in 1974 that led
to conviction. Even more striking is the fact that as few as 368 officers
(15% of all officers who made arrests) made over half of the 4,347 MPD arrests
in 1974 that ended in conviction. Eighty-four percent of all the convictions
were produced by less than 1,000 officers (41% of all arresting officers).
Over half of the 2,047 MPD arrests for felony offenses that led to conviction
were made by a handful of 249 officers.

It would be important to know whether these differences in conviction productivity were due to differences among the officers in the ways in which they investigate and/or report cases. This issue was addressed indirectly in the original study and in a subsequent replication (Forst et al., 1982). The conclusions in brief are a definite maybe.

Officers who produce higher rates of conviction per arrest are not distinguishable from officers who produce lower rates of conviction in most respects for which data was available to measure them. They are not consistently and even moderately strongly distinguishable in terms of personal, demographic or even attitudinal factors (including age, sex, place of residence, marital status, rank, experience, knowledge of the law and the value of evidence, the importance they attach to 16 factors in evaluating their own performances, the self-reported quality of their arrests and the frequency of their collecting evidence, the types of dispositions they prefer, the importance they believe their supervisors attach to the convictability of their arrests, and their interest in knowing the outcome of their arrests).

They were distinguishable in terms of their answers to the researchers' questions about how they investigate cases. But these differences did not always happen in both of the two jurisdictions in which this part of the analysis was done.

Low conviction rate producers were more likely to say that it was import-
ant to "preserve the crime scene". In contrast, high producers were more
likely to say it is important to search the surrounding area and locate and
question witnesses. High producers listed more techniques for obtaining
evidence that could prove a crime was committed and evidence that could
prove a victim was at the crime scene. There was a general tendency for low
producers to say that "nothing could be done" when queried about solving
specific evidentiary problems. High producers were more likely to report
that they were more persistent than other officers and they follow through
on their arrests. Some high producers said they had special ways of obtaining
the cooperation of reluctant witnesses.

Feeney and associates (1982) established that the police do impact case
attrition by virtue of their arrest and investigation policies. They also
confirmed that the strength of the evidence is the most important factor in
producing convictions. But their findings indicate that one must be cautious
about cross-jurisdictional generalizations regarding the importance of partic-
ular types of evidence (e.g. confessions, witnesses, tangible evidence).
The particular evidence factors that were important in one jurisdiction were
not the same in the other. And, as one might expect, the particular evidence
factors that are important for one offense-type are not the same for the
next.

For robberies in San Diego the most important evidence factor was identi-
fication evidence, specifically a positive identification by a victim/witness.
But in Jacksonville it was the availability or willingness to cooperate of the
victim/witness.

The major proof problems in burglary cases differ from those in robberies. Eye witness identifications play a smaller role in burglaries. The strongest evidentiary linkages between the offender and the crime for burglaries are: arrest at or near the scene of the crime; possession of the stolen property at the time of arrest; or a confession or statement by a co-participant.

Police arrest, release, charging, and investigation policies differed between the two cities. The evidentiary standard for making arrests was higher in Jacksonville, as was the standard for adding on serious charges (such as burglary) when suspects had been initially arrested for minor crimes. This does not mean that the San Diego police were making illegal arrest. But it did mean that there were more factors linking the suspect to the crime at arrest in Jackonsonville and that there were fewer arrests with a very low number of linking factors.

Jacksonville police did not release arrestees whereas the San Diego police did (39% of robbery arrestees, 13% of burglary arrestees and 29% of felony assault arrestees). Naturally where police release arrestees the subsequent attrition pattern will differ from what it would otherwise have been.

Of crucial relevance to our purposes is Feeney's finding that the number of evidentiary linkages between the offender and the crime is determined by police investigative policies and is NOT determined solely by the nature of

the criminal incident itself. The police can create linkages by investigative practices. What is more, in contrast to the Forst research which implies that **individual** police officers apparently differ in their ability to create these linkages necessary for conviction, Feeney identifies **particular investigative practices** that are correlated with higher conviction probabilities.

This is a crucial finding because it leads directly to policy implications. It means that conviction-producing investigative practices are not dependent upon the individual talents, knowledge and motivation of particular officers. They can be imposed upon entire police forces via explicit policies.

For instance, eye witness identification is a powerful evidentiary linkage. It is also something that the police can partially control. Obviously they can not make witnesses that do not exist. But through field interrogation and photo lineups they can convert potential witnesses into real ones. In robbery cases, the Jacksonville police attempted 20% more out-of-court identifications than San Diego and got nearly 25% more out-of-court positive identifications.

Confessions and admissions are also powerful evidence. Conviction rates were from 40% to 180% higher in cases with confessions than those without. This too is a function of policework. Jacksonville police obtained twice as many confessions in robbery cases and nearly 60% as many in burglary case as did San Diego police. Similarly, the rate of codefendant statements, another powerful piece of evidence, was much higher in Jacksonville.

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Also of special interest is Feeney's substudy to determine the **salvage-ability of arrests** that ended in non-conviction. The police and prosecutors involved in samples of robbery and burglary cases not resulting in conviction were interviewed and the cases reexamined by the research team in Jackson-ville. Both police and prosecutors believed that 80% or more of the suspects whose cases had been dropped were guilty.

Interestingly, paralleling McDonald's (1981) findings, the police and prosecutors interpreted the salvageability of dropped cases in ways that were most sympathetic to their institutional self-interest. The prosecutors thought the salvageability of the dropped cases was uniformly low whereas the police thought that in about 25% of the dropped cases the salvageability was fairly high. They thought these cases had been investigated as thoroughly as possible and were disappointed with the prosecutor's decision to drop them. Upon reviewing these cases the research team concluded that many of these dropped cases "could be salvaged by earlier police investigation, greater investigative effort to solidify cases and more risk-taking by pros-ecutors" (Feeney et al., 1982:41).

Vera Institute of Justice (McElroy et al, 1981) found that increasing the amount of information in police reports has a significant impact on the case attrition pattern in the direction of more severe dispositions. The finding was based on an evaluation of the Felony Case Preparation Project, an experi-ment implemented by the New York City Police Department in collaboration with the Bronx District Attorney's Office.

The normal reports produced by the New York City Police in cases of adult felony arrests are de minimis "reports" amounting to little more than a sentence or two giving facts necessary to establish probable cause. Any additional information has to be sought by the assistant district attorneys (ADAs) during the interview between them and the police (and sometimes the victims/witnesses) in the "Complaint Room" at the courthouse within a few hours after arrest.

In effect, in New York City the burden of documenting the case for prosecution (in the sense of creating a written narrative record of the evidence necessary for the prosecutor's case) has until now been left to the prosecutor.[2] The experimental Felony Case Preparation Project shifted some

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[2]. The question of who should bear the cost and responsibility of preparing the case for prosecution (the police or the prosecutor) is one of those hidden questions about the division of labor between these two agencies that has been answered at some point in time differently in different places.

There is always some documentation resulting from an arrest in virtually all jurisdictions. But the extent to which that documentation is oriented to the needs of the prosecutor and is comprehensively prepared varies widely. The New York City example represents an extreme minimum. Detroit and Los Angeles where after a felony arrest the police do an immediate follow-up investigation and complete a "police prosecution report" (McElroy et al., 1981:80) represent a middle ground.

The experimental project in New York was an attempt to bring the New York Police in line with Detroit and Los Angeles regarding the preparation of the prosecution documentation. But it is possible to go even further as was done in Nashville. There the Police Department has assumed an even greater responsibility for this task. They have established as case preparation unit that improves the work-product of the investigator who does the case work-up after arrest. For details see Chapter 4.

of that burden back to the police. All felony arrests (except for homicide, narcotics and organized crime) were assigned a detective to conduct immediate follow-up investigation including interviewing all parties (the arresting officer, the victims and witnesses) and even visiting the crime scene; requesting forensic analysis or conducting line-ups.

Upon completion of his/her investigation the detective prepared a special report (an Arrest Investigation Report)[3] which described the kinds of details needed by the prosecutor to assess the strength and seriousness of the case.[4] The detective was also responsible for selecting the charge. (The policy was to select the highest charge for which probable cause could be demonstrated.) The detective could also recommend that the arrest be voided, which could be done at the precinct house.[5]

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[3]. This reports sounds like the equivalent to what is known as the "police prosecution report" in other jurisdictions especially ones using the reporting system designed and distributed by the International Association of Chiefs of Police.

[4]. It included the following:
-- how the crime came to the attention of the police;
-- the nature and circumstances of the offense;
-- the way in which the suspect was identified;
-- the way in which the suspect was apprehended;
-- statements made by the complainant, witnesses, and
    the defendant;
-- physical evidence that has been vouchered; and
-- the willingness of the complainant to proceed with
    the prosecution.

[5]. This project seems similar to the experimental police prosecutor liaison project operated by the Dallas Police Department except that in Dallas the case review in the police station was conducted by an attorney without investigation experience (NILECJ, 1979).

The impact of the enhanced information was impressive. The attrition pattern for cases from the experimental precinct was changed in the direction of more severe dispositions. There were increases in the conviction rate; the indictment rate; the incarceration rate; the felony sentencing rate; and the long-term sentencing rate.

Unfortunately for our purposes, Vera's evaluation did not use our distinction between improving the **investigation** of the case (i.e., collecting more evidence in the field) and improving the **reporting** of the known facts. So it is unclear as to how much of this impressive project impact was due simply to extracting and transmitting more of the information that the arresting police officers already knew. However, Vera does say that only seven percent of the project's detectives' time was spent on post-arrest investigations. Thus, it seems that most of the project's impact was due to simply increasing the flow of information that was already in the possession of the police (and witnesses/victims).

III. Conclusion

Successful prosecution of a criminal case depends upon the quality of the information supplied by the police to the prosecutor. Differences in the amount and kind of information in case files will result in different patterns of case attrition regardless of the merits of the case. Some unknown but substantial portion of felony arrests result in dispositions that are more

lenient than would have occurred if a more comprehensive prosecution case file had been prepared.

To some extent improvements in the fund of information in police prosecution reports can be achieved by improving the quality of the investigation in the field. But under certain conditions a substantial improvement can be made by programs that increase the amount of information that is already known to the arresting police officer(s) that gets reported to the prosecutor.

The amount of improvement achieved by experimental new programs will be related to the quality of the case preparation system that exists. In jurisdictions like New York City where the police formerly did virtually no case preparation for prosecution in most felonies the improvement is likely to have a substantial impact on the pattern of attrition in the direction of more severe case outcomes. In other jurisdictions where the police devote substantial resources to preparing a prosecution report, i.e., a documentation of the elements of the case need to prove the case at trial, the incremental improvement in the quality of case preparation may reach a point of diminishing returns.

CHAPTER 4

NASHVILLE DAVIDSON, TENNESSEE:

THE FIELD TEST SITE

I. The Environment

A. Political Organization

Nashville-Davidson, Tennessee is a city and county area which has cons-

olidated its governmental operations into one governmental unit known as the

Metropolitan Government of Nashville and Davidson County. Thus, the geograph-

ical jurisdiction of the Metropolitan Police Department is virtually congruent

with that of the county's public prosecutor, known in Tennessee as the Dis-

trict Attorney-General.

Consequently, unlike most American urban jurisdictions where the prose-

cutor's office must deal with cases prepared by a dozen or so different

police agencies, the prosecutor's office in Nashville-Davidson receives

virtually all of its cases from one police department. Al   typical of

the police-prosecutor interface elsewhere is the close and convenient physical

proximity between the police department and the prosecutor's office. Unlike

jurisdictions where a visit to the prosecutor's office involved a lengthy

trip across town or county, the Nashville-Davidson police merely have to walk across the street.

While these two features of the police-prosecutor interface in Nashville-Davidson are unusual they do not detract in any significant way from the generalizability of the results of our field test. The success of the software prototype we developed was not dependent upon these features of the test site. If anything, the case preparation experience in Nashville-Davidson prior to the mid-1970's (described below), underscores the need and potential value of a computer-assisted case intake program.

Despite the advantages of the physical proximity and having only one police department to deal with, the cases transmitted to the prosecutor's office prior to the mid-1970's were of uneven quality. Dissatisfaction with them led the police department to obtain a grant from the Law Enforcement Assistance Administration to improve the quality of case preparation.[1]

As a result of that grant and several related improvements, the quality of case preparation has increased immeasurably and is now regarded quite fav-

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[1]. Grant Number 76-A47R4301, "Criminal Case Preparation-A Police/Prosecution Coordinated Project," a block subgrant to the Metropolitan Government of Nashville and Davidson County. Project Summary: Paraprofessional aids will be employed to structure, organize, and type police investigations at the time of booking or warrant issue. This procedure should lead to improvements in the thoroughness of police crime investigations in the sense that there will be less omissions of vital case prosecution information, fewer overt investigative errors which lead to case dismissal or radical plea bargaining, and a smaller time lapse between arrests and the time that the details of the case forwarded to the District Attorney's Office for prosecution. (Taken from a computer search of Department of Justice research grants related to police-prosecutor coordination performed by the National Criminal Justice Reference Service.)

orably by prosecutors. But, the current system of case preparation (involving a Case Preparation Unit, described below) is costly and does not represent a model which could be adopted by medium or small departments or even some large departments.

B. Burglary in Tennessee

The crime we used in developing our software for assisting case preparation is burglary. Tennessee law distinguishes three degrees of burglary plus five other offenses that are burglary-related. The relevant sections of the 1982 Tennessee Code Annotated (TCA) are presented below.

<u>Burglary, First degree</u> (TCA 39-3-401)

Burglary is the breaking and entering into a dwelling house, or any other house, building, room or rooms therein used and occupied by any person or persons as a dwelling place or lodging either permanently or temporarily and whether as owner, renter, tenant, lessee or paying guest, by night, with intent to commit a felony.

<u>Burglary, Second degree</u> (TCA 39-3-403)

Burglary in the second degree is breaking and entering into a dwelling house or any other house, building, room rooms therein used and occupied by any person or persons as a dwelling place or lodging either permanently or temporarily and whether as owner, renter, tenant, lessee or paying guest, by day, with the intent to commit a felony.

<u>Burglary, Third degree</u> (TCA 39-3-404a)

Burglary in the third degree is the breaking and entering into a business house, outhouse, or any other house of another, other than a dwelling house, with the intent to commit a felony.

<u>Safecracking</u> (TCA 39-3-404b)

Any person who, with intent to commit crime, breaks and enters, either by day or by night, any building, whether inhabited or not, and opens or attempts

to open any vault, safe, or other secure place by any means, shall be punished....

Breaking After Entry (TCA 39-3-402)

Any person who , after having entered upon the premises mentioned in 39-3-401, with intent to commit a felony, shall break any such premises, or any safe or receptacle therein, shall receive the same punishment as if he had broken into the premises in the first instance.

Breaking Into Vehicles (TCA 39-3-406)

Any person who shall break and enter into any freight or passenger car, automobile, truck, trailer or other motor vehicle. either in the day or night with intent to steal therefrom anything of value, or to commit a felony of any kind, shall be guilty of burglary....

Carrying Burglar's Tools (TCA 39-3-408)

Any person who carries concealed about the person any false or skeleton keys, jimmies, or any article of the kind intended for effecting secret entrance into houses or motor vehicles, for the purpose of committing theft, or other violations of the law, is guilty of a felony....

Burglary With Explosives (TCA 39-3-702)

Any person who, with intent to commit crime, breaks and enters, either by day or by night, any building, whether inhabited or not, and opens or attempts to open any vault, safe, or other secure place by use of nitroglycerine, dynamite, gunpowder, or any other explosive, shall be deemed guilty of burglary with explosives.

The sentencing provisons were modified by the Criminal Sentencing Reform

Act of 1982 which divided all existing sentencing ranges into two ranges,

one more severe than the other. "Range I" sentences range from not less than

the minimum sentence to not more than the minimum plus one-half of the dif-

ference between the maximum and the minimum. "Range II" sentences are not

less than the minimum plus one-half of the difference between the maximum

and the minimum and not more than the maximum. Judges retain the power to

fix the exact sentence but must sentence offenders defined as "standard" or

as "especially mitigated" to a term within Range I. Those defined as "persis-

tent" or as "especially aggravated" must receive terms within Range II (TCA 40-35-109).

Twice in the last four years the legislature has shortened Tennessee sentences in efforts to cope with severe prison overcrowding and a court order to do something about it. In 1982 the normal parole time was cut by 30% and was cut again as of January 1,1986 by an additional 35% (thereby constituting a 65% reduction since 1982). Prosecutors say that this latest cut has made it "impossible" to plea negotiate in certain cases.

C. Demographic Profile

The Nashville-Davidson area covers 501 square miles and is the second most populous incorporated place in Tennessee with a 1980 population of 477,811 (Bureau of the Census, 1980:Vol.I: part 44, sec. a-c). The 1980 population represents a 6.7% increase over the 1970 figure. The population is 22.3% black and 25.0% is under 18 years old. In 1979, 12.6% of the 435,080 persons living in the city of Nashville-Davidson were earning incomes below the poverty level (Bureau of the Census, 1980:Vol. I.,part 44, sec.D, Table 245).

In 1984 the Nashville-Davidson Police Department employed 1,212 people of which 961 were officers and 251 were civilians (Federal Bureau of Investigation, 1985: Table 76). The Department has a burglary unit staffed by 38 detectives. The number of index offenses known to the Nashville-Davidson police in 1984 was 31,125 of which 8,788 were burglary (see Table 4.1).

Table 4.1

Index Offenses Known To The Police
Nashville, TN. - 1984*

Murder and non-negligent manslaughter	72
Forcible rape	410
Robbery	1,438
Aggravated assault	1,184
Burglary	8,788
Larceny-theft	17,379
Motor vehicle theft	1,854
Arson	---
Index Crime Total	31,125

* Federal Bureau of Investigation, 1985.

D. Court Structure and Case Attrition

Tennessee has a two-tier court structure for criminal matters. The general sessions court (i.e. the lower court) has the authority to issue warrants and to set a bond schedule for the release of bailable prisoners. The general sessions court also holds preliminary hearings on criminal charges. The judge may try the case if the charge is a misdemeanor within the jurisdiction of the sessions court, if the defendant has waived his right to indictment, presentment, grand jury investigation and jury trial, or if a plea of guilty to the misdemeanor charge has been entered. Otherwise, the case is transferred to the criminal court (i.e. the court with the general criminal trial jurisdiction (Tennessee State Supreme Court, undated:140). Davidson County is served by the 20th Judicial District Criminal Court.

No statistics are available on the number of arrests for burglary in Nashville for 1984. But a tally of the January, 1984 docket of the General Sessions court found that 108 defendants involved in burglary-related charges were listed. This projects to an annual rate of approximately 1242 cases per year.

In 1984 a combined total of 938 "burglary" cases (i.e. the initial charges written by the police were burglary-related) were disposed of by the General Sessions and the Criminal courts in Davidson County. In the General Sessions Court the most common disposition was for the cases to be dropped without a determination of guilt. Of the 442 General Sessions burglary cases only 19.5% were convicted. The rest were dismissed, not prosecuted ("noll-ied"), retired (a slow dismissal), or reached an "other" disposition (see Table 4.2).

In contrast, the most common disposition of 1984 burglary cases in the Criminal Court was a conviction. Of the 496 cases disposed, 65.% were convicted; 0.8% acquitted; and the balance were dropped. Adding the data from the two courts together one gets an overall conviction rate of 43.6%; acquittals at 0.4%; and 56% of the cases dropped without a determination of guilt for all burglary cases disposed of by all courts in Davidson County in 1984.

The Criminal Court's pattern of case attrition for burglaries mimics the general pattern of attrition for all felony cases disposed of by that

Table 4.2

Burglary Dispositions By Court and By Year, Davidson County, 1984-85*

Disposition	General Sessions Court (lower court)		Criminal Court (felony court)		Total	
	1984	1985	1984	1985	1984	1985
Not guilty	0.0	0.0	0.8	1.5	0.4	0.7
Guilty	19.5	30.0	65.1	73.4	43.6	51.7
Nolle prosequi	17.6	14.2	2.8	2.1	9.9	8.1
Dismissed	33.5	35.6	14.7	11.8	24.1	23.7
Retired	21.3	16.6	15.7	8.4	18.5	12.5
No true bill	0.0	0.0	0.0	0.8	0.0	0.4
Other	7.9	3.5	0.8	2.1	4.3	2.8
	100.0	99.9**	99.9**	100.1**	99.9**	100.0
	[N=442]	[N=337]	[N=496]	[N=466]	[N=938]	[N=803]

*   Source: Office of the Criminal Court Clerk, Metropolitan Nashville, unpublished data.

** Error due to rounding.

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Court in 1984, as shown in Table 4.3. These data also show that 92% of the 2167 felony convictions in the Criminal Court were obtained by guilty pleas (as opposed to trials). (No comparable data exist that separate out guilty pleas from convictions at trial for burglaries alone.

Compared to other jurisdictions, the overall drop-out rate for burglaries in Davidson County (i.e. combining all the drop-out from both the general sessions court and the criminal court) is high, see Figure 4.1. Davidson's rate is from two to five times higher than the six comparison jurisdictions. Why this is so is unclear. It can not simply be attributed to the lack of

Table 4.3

Case Dispositions For All Felonies
Criminal Court, Davidson County, Tn., 1984*

Acquittal	1.8
Convicted after trial	5.9
Dismissal	7.8
Guilty plea	64.2
Remanded to general sessions	0.06
Special remedy relief	4.7
Transferred to other court	0.03
Defendant not apprehended	
Nolle prosequi	5.6
Other	9.7
	99.8**
Grand Total Disposed	[N=3092]

* Tennessee State Supreme Court, undated: 89.
** Error due to rounding.

case screening in Davidson because the comparison is with what happens to all arrests in the other jurisdictions.

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Figure 4.1

BURGLARY DISPOSITIONS FROM
ARREST THROUGH TRIAL

(N=1475)	(N=395)	(N=242)	(N=106)	(N=800)	(N=222)	(N=938)

Los Angeles District of Columbia New Orleans Cobb Co. Georgia Detroit Indiana-polis Davidson Tenn.

Dropped · Plea · Trial Conviction

Acquitted · Other
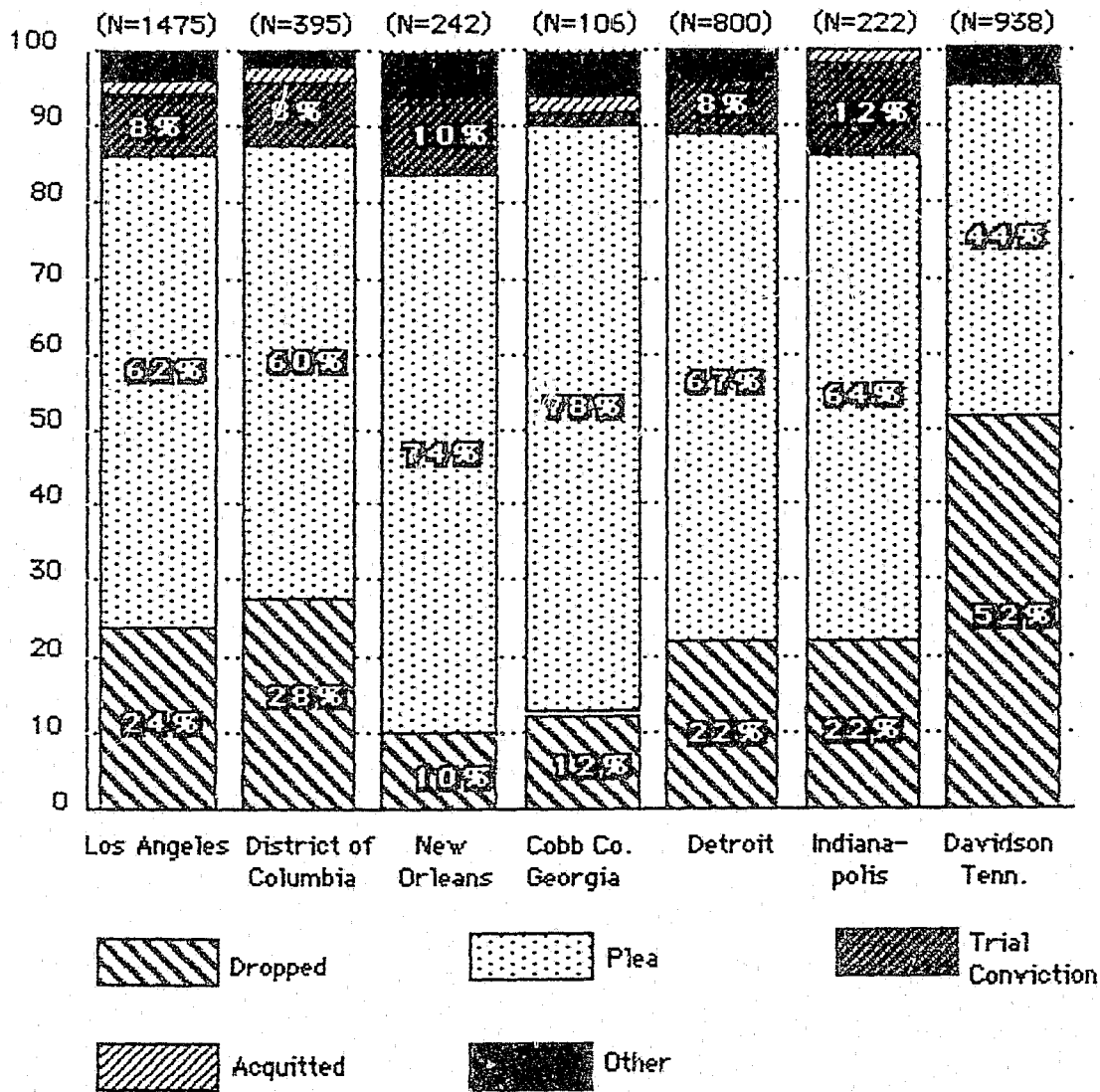
*About 6 percent of the nolles and dismissals were referred to other jurisdictions for prosecution

** Includes 2 percent conviction, and 2 percent acquittal

*** Includes 3 percent acquittal

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II. Felony Case Processing

A. Three Routes to Disposition

Burglary cases move through the Davidson court systems along three routes. The differences are in terms of the quality of case preparation and the likely case disposition.

One route begins with a report of the burglary by a victim/witness to the police. A patrol officer will respond to the event and file a report of it with the central records office which in turn distributes copies of the report to the burglary detective division. When an arrest is made, the arrest report is filed with central records and a copy is sent to the burglary division where it is assigned to an individual detective.

As best we can tell, cases made by the police tend to be stronger than those made by citizen victims and are less likely to drop out at the lower court. Cases which have been made by detectives are more likely to be disposed of in the criminal court than in general sessions. In theory burglary detectives are responsible for enhancing the quality of all burglary cases that flow through the system no matter how they were entered. But as a practical matter detectives are primarily concerned with their own cases and not the ones that originate arrests by patrol or arrests on warrants initiated by citizens.

Cases in which patrol officers catch burglars red-handed (route 2)

usually are processed through the system based entirely upon the patrol

officer's reports with virtually no supplemental work done by the detective.

A substantial but unknown proportion of the burglary cases follow this route.

The third route is where citizens obtain arrest warrants directly from the

court. The only "case preparation" in these cases is the statement made by

the victim on the affidavit upon which the arrest warrant is issued. These

and all arrest warrants are served by a special warrant unit of the Police

Department who have no further responsibility for these cases than simply

serving the warrants and making related arrests.

It is believed that these cases usually get dismissed or nollied at

General Sessions Court. If there is some merit to them, they will be nollied

at General Sessions Court and rebrought by presenting them to the grand

jury. At that point the prosecutor to whom the case is assigned will notify

the police Case Preparation Unit to send over the police folder on the case.

 The Unit in turn will have to track down the detective to whom the case had

been assigned and request his investigation report and other reports. But

the detective will regard the case as one that was not **really** one of his

because he did not make the arrest. Moreover, by the time the case finally

reaches him it will be cold.

The critical time for getting confessions, denials and other statements

from defendants is during the arrest. Trying to get that type of evidence

several days or weeks later is considerably more difficult. Consequently,

detectives do not look at these citizen-initiated cases as ones worth investing much in.

After arrest a defendant is presented in the general sessions court for the setting of bond. If the defendant can not make bond, then he will be given a preliminary hearing which will be held within two days. If he can make bond, then the preliminary hearing may occur within three to ten weeks. If probable cause is found, then the case is bound over to the grand jury. If indicted, the defendant is then arraigned in the criminal court and later disposed of.

B. De Facto Screening

There is no formal case screening by either the police or the prosecutor's office. That is, there is no organizational unit that systematically reviews cases for the purpose of identifying for rejection or dismissal cases which because of evidentiary weakness or for other policy reasons are regarded as not meriting further attention. Rather the responsibility for the process of winnowing cases is spread among various actors, judicial, prosecutorial, police, and private citizen; and it is done on an ad hoc, case-by-case basis, as opposed to a policy-guided review. It begins with the police-citizen interaction and continues to the decisions made in the lower and upper courts.

One of the remarkable features of the ad hoc approach to case selection in Nashville is the extent to which the private citizen (victim or witness of the crime) is given official standing and responsibility for prosecuting

the case. In Tennessee the custom is to refer to the crime victim (or complaining witness) as "the prosecutor" (instead of "the complainant" as is common elsewhere). The public prosecutor is referred to as the "district attorney general" or "the general" for short.

The term, "the prosecutor," is always carefully reserved and used by all actors in the system to refer to the private citizen who is the chief complaining witness and who is publicly regarded as the person who decides whether the case will go forward.

Thus, for instance, an outsider is astonished to sit in General Sessions Court during the calling of the morning docket. A case will be called and one expects it will be prosecuted because a "general" (an assistant district attorney general) is present in the courtroom and has been prosecuting other cases. But when the court calls for "the prosecutor," the general steps away and everyone looks around to the audience for the private citizen prosecutor to come forward and prosecute the case. If the citizen prosecutor is not present, the defendant is instructed by the court to move for dismissal for want of prosecution and the case is dismissed due to "nolle prosequi".

This attitude toward the victim as a controlling agent in the screening process extends to the street-level screening that is done by the police. Research (Black and Reiss, 1967) in other cities has shown that in exercising their discretion as to whether to report a crime the police are strongly influenced by the wishes of the victim as well as the relationship between the victim and the offender and the victim's deference towards the police.

It is fair to assume that these same factors influence the Nashville police to some extent. But in Nashville there is an added factor that places even greater emphasis on the wishes of the victim.

The Nashville police have a conscious albeit informal policy of leaving the responsibility for the actual filing of the report with the victim/witness as often as possible. The citizen is told that he/she must go downtown to the courthouse and swear out a complaint. This relieves the police officer of the burden of making out the report and of the responsibility of being in general sessions court at the preliminary hearing. Although the police say they are trying to change this practice and encourage officers to take the responsibility for more of these cases, they also point out that the practice has its important benefits.

In addition to saving police time and effort, it saves court time and effort. What better way to filter out those cases which usually drop out of the court process anyhow than to test the victim's commitment to the prosecution at the very beginning! If the victim will not go to the courthouse to request an arrest warrant when he/she is at the peak of his/her emotional response to having been victimized, there is little likelihood of his/her sticking with the prosecution of the case through the rigors of court hearings and trial.

The net effect of this policy is unclear. We have no data by which to measure it. One might speculate that it would result in fewer cases being referred to court because research has shown that victims and witnesses do

lose interest in their cases (Cannavale and Falcon, 1976; Brosi, 1979). But our limited observations of the arrest warrant application counter of the Davidson County "night court" suggest that it may have the opposite effect. The citizens of Davidson County seem to be aware of their power to get arrest warrants and they do so in a steady stream. If anything, the policy probably results in about as much work overall for the police and the courts.

Beyond what happens on the street there is virtually no additional screening by the police. The police Case Preparation Unit does not perform a screening function. If a case appears to be weak, the most the Unit might do is to casually recommend to the assistant district attorney general (ADAG) that it be dismissed. Similarly there is virtually no screening done by the judicial officer known as the "commissioner" who issues arrest warrants.

It is the preliminary hearing that serves as the major screening mechanism. This is where some of the wheat is separated from some of the chaff. Many of the cases which were initiated by citizens obtaining warrants will be dismissed for want of prosecution. Other cases will also be dismissed or the charges modified. Some felonies will be reduced to misdemeanors sometimes in exchange

Table 4.4

Case Dispositions for Selected Burglary Cases
Court of General Sessions, Nashville, January, 1984

Charges	Dispositions
o Burglary	Dismissed, P's w no show
o Burglary from auto	T/R 6 mos T/S + C

o Burglary forced entry   Fine & Costs

o Burglary,broke 3   Offered 4 mos, retire, plea
  windows while searching   bargain

o Burg/malicious mischief   60 days suspended/$140 restitution-
                                           used to live together - broke
                                           up

o Burg,demolished houses $1000

o Burg,forced entry   Probation

o Burg,observed tampering   Nolle, do not present to GJ
  with a screen, fled

o Burg,photographed pass-   Amend to passing, nolle and
  ing check stolen   present to Grand Jury
  in burglary

o Burg, masterkey,   Amend ACT
  unlocked, asked where
  office, left

o Burg, 2nd deg,   Bound over
  fingerprints

o Burg, steal tv from   Continued
  motel

o Burg, forced entry,   Consp to burg, all but
  caught inside business   90 days

o Burg, witness saw def   Retire, no vic, 3rd time
  leave vic's home w/tv
  set, vic didn't..
  total $1500 goods

o Burg, safe,vault   Bound over
  confessed he broke in
  at night
  & took tv etc

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for guilty pleas. A look at what happens in this process to a sample of

burglary cases is presented in Table 4.4.

Cases that are bound over to the grand jury are sent to the District

Attorney General's Office where they are prepared and reviewed before submis-

sion to the grand jury. This work consists of three parts. A clerk gathers

together all the information on each case. This involves contacting the

Police Case Preparation Unit and requesting that all police reports be for-

warded. It also involves obtaining prior records, a responsibility that the

prosecutor not the police assumes.

Next the cases are divided among the trial teams and reviewed by an

ADAG on each team using a checklist (see sample Case Preparation Evaluation

form) to assure the case readiness. Finally, the ADAG submits the case

along with a recommended charge(s) to the District Attorney General for

ultimate approval.

This grand jury preparation process is not used as a major

filtering device. Cases as rarely screened out. ADAGs can recommend that a

case be put into the pretrial diversion program or that a warrant be dismis-

sed. But they rarely do the latter. Their case acceptance standard is what

Jacoby (1977) would call "legal sufficiency." If there is probable cause,

then the case is accepted. If the evidence is weak, plea negotiations will

be used to obtain a guilty plea. As one ADAG explained, "if you know you've

got the guilty guy, you'll just have to gut it out. Weak cases will fall

through on pleas bargaining. You'll make sweet deals they can't refuse."

In summary, despite the physical proximity between the police department

and the prosecutor's office in Nashville, there is no face-to-face pre-indict-

ment prosecutorial screening in which prosecutors have the opportunity to
review cases with the relevant police officers or the victims/witnesses.
Nashville continues to rely on the de facto screening that results from the
independent decisions of a variety of actors in the process: victims, witness-
es, police officers, commissioners, judges and assistant prosecutors.

Nashville has tried to solve the case-related communication problem
between police and prosecutors primarily by improving the quality of its
written-document method of communication. This was done through the estab-
lishment of the Case Preparation Unit.

C. Plea Negotiations

Plea negotiations in Davidson County involve numerous options including
both sentences and charges. Prosecutors may agree to reduce the defendant's
sentencing exposure from being a "Range2 offender" to a "Range1 offender".
Or, the negotiation may be within either range. The sentence must be specific
so prosecutors may agree to support a sentence at the "lower end of the
range." Or, they may agree to not charge the offender with aggravating factors
(which would invoke a higher mandatory minimum sentence). Or, they may
recommend or oppose probation or reduce the charges.

Charge negotiations in burglary cases most frequently involves a reduc-
tion of the felony-level charge to a misdemeanor charge. This is usually
done by reducing the charge from burglary to "attempt to commit a felony"
(ACF) (see Table 4.5). The ACF charge is used rather than petty larceny

Table 4.5

Differences Between Initial Charge and Charge at Conviction By Court
Davidson County, TN, 1984-85*

I. General Sessions (lower) Court

	Police or Commissioner charged the case as:				
Charge at conviction was:	Burglary, 1st degree	Burglary, 2nd degree	Burglary, 3rd degree	Burglary, unspecified	Other type burglary
Burglary, 1st degree	1				
Burglary, 2nd degree				2	
Burglary, 3rd degree			4		
Burglary, unspecified			4	10	
Malicious mischief/destruction		1	4	19	4
Trespassing		1	13	18	
Concealing stolen property					
Petty larceny					
Grand larceny					
Attempt to commit a felony	3	6	13	40	5
Crime not specified	2	2	5	24	4

Table 4.5 (cont'd)

II. Criminal (felony) Court

| | Police or Commissioner charged the case as: | | | | |
Charge at conviction was:	Burglary, 1st degree	Burglary, 2nd degree	Burglary, 3rd degree	Burglary, unspecified	Other type burglary
Burglary, 1st degree	12	1	2	39	
Burglary, 2nd degree	15	61	1	112	
Burglary, 3rd degree	2	1	104	91	2
Burglary, unspecified		3	11	84	
Malicious mischief/destruction		1			1
Trespassing					
Concealing stolen property		5	1	9	
Petty larceny	1		2	7	
Grand larceny		4	4	7	
Attempt to commit a felony	1	3	15	25	
Crime not specified/other		6	3	21	11

* Source: Unpublished data, Office of the Clerk of the Criminal Court.

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because under Tennessee law all larcenies even petty ones are felonies with a mandatory minimum sentence of one year.

Examining the charge reduction pattern for burglaries in the criminal court (see Table 4.5) one notices a remarkable degree of charge stability. Most of the cases are convicted of the original police charges. What exactly this means is problematic. The only unequivocal inference that can be drawn is that plea negotiations in burglary cases at the criminal court level must rely heavily on sentence considerations rather than charge reductions.

Other inferences might be drawn but they are more problematic. One might conclude that the initial charging by the police (or the judicial commissioner) is fairly accurate or that the preliminary hearing serves as a fairly good screening mechanism which only allows the accurately charged cases to proceed on to the criminal court.

III. The Quality of Case Preparation

A. Background

According contemporary and knowledgeable sources, prior to 1976 the quality of case-related communications between police and prosecutors in Nashville were seriously wanting. In the early 1960's the Police Department lacked any systematic method for recording the details of criminal cases and preparing them for prosecution. The Department's record keeping was the barebones minimum.

A patrol officer reporting a crime or an arrest would file "reports" which contained almost none of the details needed to investigate or prosecute the crime. Significantly, the form used to report arrests was called an arrest "slip", not an arrest "report". It merely recorded the defendant's name, date of arrest, the charge and a few other matters. The incident report form was also minimal. Officers were not required to systematically document such crucial details as how the officer came to have probable cause to arrest and search; who the witnesses were and what they could testify to; and what evidence was recovered.

The officer would make a few notes on his notepad and would call in his "report" to the Central Records Office of the Police Department where a clerk would type up the notes. Central Records would then distribute a "dope sheet" to all officers and a copy to the detectives.

If an arrest were made, the case would proceed to the lower court based solely upon the arrest slip. If the case were bound over to the grand jury, the police officer involved would meet with the assistant prosecutor or the prosecutor's investigators to "review" the case and fill out the indictment. However, there was no paperwork/documentary backup to the police case.

This changed in 1968 when a new system of general police reports was introduced. The system was brought in through the International Association of Chiefs of Police. It included a set of three forms which were designed specifically as police reports to the prosecutor. These forms have been

modified and enhanced somewhat over time, but they are substantially the same as the forms currently referred to as "Case Preparation Report Forms 211 A/B/C.

In 1973 the system for case-related communications between police and prosecutors was further enhanced. A police sergeant from Washington, D.C., helped Nashville establish a police-prosecutor liaison unit. A Nashville police sergeant was assigned to the prosecutor's office for the purpose of improving case-related communications. He developed the practice of taking all cases which were bound over to the grand jury and checking back with the Police Department to make sure that all the paperwork in them had been done and transmitted to the prosecutor's office.

Even with the new IACP forms there had continued to be serious breakdowns in the case-related communications between police and prosecutors. In those days the prevailing police opinion was that police reports were not important and that the police responsibility for a case ended with arrest.

When sergeants were told that their officers were not competing and transmitting their reports, the sergeants' response was to defend and make excuses for them. Disciplinary actions were not used to enforce the officer's responsibility for filing timely reports. It was not uncommon for weeks or months to go by before the officer wrote his report.

In addition to this attitudinal problem there was a structural one. In order to file a complete report, it was necessary to go to as many as eleven

different places within the police building in order to gather all the pieces
together including: the general report; the supplemental reports; the prose-
cution reports; copies of the warrants; defendant's prior records and mug
shots; transcriptions or witness statements; forms with descriptions of phys-
ical evidence collected, line-ups and photographic identifications and other
documents.[2]

In 1976 it was decided to seek a grant from the Law Enforcement Assist-
ance Administration to develop a better system of case-related communication.[3]
This system became the Case Preparation Unit which continues to operate
today.

B. The Case Preparation Unit

The purpose of the Case Preparation Unit was to solve the remaining
obstacles to good quality case-related communications.
It would solve the problem of delay by requiring that all officers file
their reports before the end of their shifts on the day in which the incidents
occurred. It would make it easier to complete the prosecution reports (the
211 A/B/C's) by having the police dictate those reports. It would improve
the quality of what the police put in the reports by developing a series of
crime-specific interrogatories addressing the legal elements required for
specific crimes.

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[2]. This problem of coordinating and ensuring the transfer to
the prosecutor of the numerous documents involved in cases is
universal.

[3]. Grant Number 76-A47R4301.

These interrogatories were used by para-legals (law students, originally) who debriefed the reporting police officers with them. That is, in connection with the open-ended narrative section of the prosecution report (211 C), the police officer would be guided and/or prompted by the para-legal to address each of the questions relevant to the specific crime. For instance, the case elements for burglary in Tennessee are (1) breaking and (2) entering a building (3) belonging to someone else (4) with intent to commit a felony. Time of day and type of building determines the degree of burglary.

The officer was instructed to dictate a chronological account of the incident; the police actions in investigating it; the arrests and searches made; and the nature of the evidence. The para-legals would ask questions to clarify or expand the account.

An unusually rigorous evaluation of the initial Case Preparation Unit found that the project had significant positive impacts on all the goals it set out to accomplish (Domash et al., 1981). Compared to the traditional method of case preparation, the Case Preparation Unit's method had the following benefits: it reduced the delay between the arrest and the report completion; officers appeared to spend less time preparing reports; all officers preferred the Case Prep method to the old method; the assistant district attorneys rated the cases as significantly better along all eight of the dimensions used in the evaluation; and the documentation of the case elements in the written reports improved significantly.

Since it began the Case Preparation Unit's operation has undergone some changes. In 1980 it was decided that officers would not prepare the prosecution reports (211 A/B/C) at the time he booked the arrestee. Instead cases would not be prepared using the Case Preparation Unit's input until and unless the District Attorney General's Office requested it. (Of course, the normal manually produced general and arrest reports would be written. Only the special reports for the prosecutor, the 211 A/B/C's, would await the prosecutor's request.) This policy was designed to avoid wasting resources on those cases which would drop out of the system without being referred to the Grand Jury. It is only the latter cases for which the District Attorney General's Office requests police reports.

Other changes are that the Case Preparation Unit has cut back its operation from 24 hours-a-day to 19, although it still operates seven days a week. Also, the para-legals have been replaced by police officers who have earned law degrees. Thus the current operation of the Case Preparation Unit represents an unusual concentration of resources that could not be afforded by most smaller departments. The Unit consists of one lieutenant a sergeant and two typists one each for two and a half shifts; and several of these officers are lawyers.

Today police officers dictate their reports under the guidance of the Unit's supervising officers/lawyers. As before, if the supervisor hears something that he wants clarified, he will interrupt the dictation and ask the question. Both the question and the answer will be transcribed and become part of the report.

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An example of such a question and answer from an actual report is presented below. Clearly the questions asked in these exchanges do a lot to strengthen the documented record of the case. Notice in the example below how the supervisor gets the reporting officer to nail down important details necessary for successful prosecution, such as establishing the linkage between suspect JFB and the house where stolen articles and drugs had been found.

Q. There is a third suspect that you have not arrested.

    What is his name?

A. JFB, date of birth 12-12-46, white male. Officers had him
    stopped earlier, before I got over there to execute the search
    warrant.

Q. Did anybody see him come out of the house prior to
    you serving the search warrant?

A. I'm not sure if they did or not. When he was stopped, he was
    with Mr. K.

Q. Which officers stopped him?

A. Officer B and Officer F. Officer B wrote Mr. K a citation.

Q. That was just a few minutes before you served the search warrant?

A. Yes, and if I'm not mistaken, it was either Officer RB or Offi-
    cer M that saw Mr. K and Mr. B get into Mr. K's car and drive
    away from the residence right before I executed the search
    warrant.

Q. I need information from one of the officers saying the
    watched him leave the house. We need to link him to the house
    also.[4]

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[4]. Later the supervisor checks on the strength of the
case in two ways. He inquires about the victims' commitment to
prosecuting the case and he checks for possible incriminating
statements. These are the kinds of details that prosecutors in
many jurisdictions complain that they need but do not get from
the police (McDonald et al., 1981).

Q. They (the victims) are willing to prosecute aren't they?

A. They will prosecute if they have to.

Q. You're prosecuting at this time and they are willing to come back to court if necessary?

A. They say they are, yes.

Q. Did either one of your two suspects that you arrested, S or K, did they incriminate this third suspect? Did they say anything about him?

The Case Preparation Unit should not be mistaken for a true screening process. The unit does not exercise an independent judgment as to whether to proceed with the case or terminate it. The unit does not meet with victims-/witnesses to assess their credibility or commitment to prosecuting the case. The Unit's contribution to the preparation of a case consists of assisting the officer in the preparation of the prosecution reports and in assembly the other related documents and coordinating case information re-quests received from the DAG's Office.

The Unit will sometimes indicate to the police officer in charge of the case the need for further investigation and may occasionally send the officer back for more evidence. For instance, Tennessee law provides that codefendants can not be convicted on each other's testimony. Some corrobor-ating evidence is necessary. The Unit's officers say they are especially alert to this need.

CHAPTER 5

THE SOFTWARE DESIGN AND DEVELOPMENT

I. THE SYSTEM DESIGN

A. General Considerations

In designing our computer-assisted case preparation software system, several factors were considered including: the tasks the system was intended to accomplish; the hardware required to operate the software; the abilities of the people who would interact with the programs; whether changes to the software would be required and, if so, who would make them; whether the software should operate in batch mode or in "real time"; the speed with which the software must operate; and the quantity of data which would be generated and/or operated upon. The answers to these questions in turn influenced the selection of a development language (the software used to write the applications software, i.e. the end-product software).

B. The Software's Purposes

The primary purpose of this software was to assist police officers in writing case reports that were more comprehensive, legible, consistent and complete from the point of view of the prosecutor, and easily comprehendible than the typical manually produced report. It was to try to approximate the

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kind of detailed report that can usually be produced only by an interview between an experienced prosecutor and the reporting police officer(s).

Exploiting the computer's capacity to branch and probe, the software would lead the reporting officer through a series of questions that would elicit the details of the case. Certain sequences of questions would be asked only if they were relevant (for example, questions about witnesses would be asked only if witnesses were involved in the case).

In addition the software was supposed to assist the police in selecting the appropriate charges in the case and to provide them with immediate feedback regarding what, if any, additional investigative actions needed to be taken.

The software was to be developed only for the four felonies involved in the most frequent arrests in the field site, not the entire penal code. This was a compromise between assuring that enough cases for an adequate evaluation would be generated by the project and conserving project resources. If the software was demonstrably valuable, then the rest of the penal code could be added to the software in the future by some unspecified interested parties possibly with government funding.

Because of delays and other matters described below the tasks to be achieved by the software were reduced. Instead of four crimes, only one crime (burglary) was included; and the two "expert system", "artificial

intelligence" features whereby the software was supposed to help select charges and direct follow-up investigations were not developed.

C. Target System Characteristics

It was intended that this prototype software should be designed on a system with the maximum possible future application to other police departments of varying sizes and degrees of financial resources. The entire system (software and hardware) would have to be inexpensive to purchase, operate and modify. This was to ensure that small and medium-size departments would be able to afford the system. Therefore, it was decided to build the system to operate on a microcomputer-based system.

Minimizing the cost of the system was a major factor in the design. It meant that we not only excluded from consideration the possibility of writing a program that would run on large main-frame computers or on the medium-sized mini-computers; but even among the micro-computers we chose the most inexpensive and also the most limiting model, the dual floppy disk model (as opposed to models with hard drives). In retrospect, this emphasis on minimizing costs was shortsighted and unnecessary, see discussion below.

To reach the widest possible audience, we stayed within the confines of the MS-DOS/PC-DOS operating system, a widely used system. Based upon our experience, we believed that most of the microprocessor-based computer systems in use in small law enforcement agencies are rudimentary. Unless they were acquired recently, they may lack a hard disk; be unable to exploit the LOTUS-/INTEL extended memory protocol; and not have the present DOS maximum of

640K RAM. Thus, it was decided to develop software that would require no
more than two floppy disks and 640K memory.[1,2]

The software was developed for a system with a color monitor because of
the value of color in assisting the unfamiliar user in gaining experience
and productivity. Differentiating the functions of screen areas and portions
of text through the use of contrasting colors, for example, seemed important
in light of the number of users who would not be experienced in the use of
computers.[3,4]

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[1]. This would mean, in the worst case, the addition of a
single floppy disk drive (under $100) and some memory (384K or
less in the majority of cases: about $150 for the board plus
about 15 cents per K).

[2]. While some existing systems may not be expandable to
640K, this fact had to be set against the cost of developing
programs which would run in, say, 256K. The user would spend an
inordinate amount of time changing diskettes, or would be obliged
to store data on his/her program diskette. Not only is this
inconvenient, it increases the risk of error.

[3]. For systems without a color capability, it would be a
simple matter to delete the references to color in the source
code using a word processor, then recompile the code one time.
This would produce a monochrome version of the software. We would
expect this version to be significantly less readily learned and
used by officers unfamiliar with computers, but the quality of
the end product should not be affected in any way.

[4]. Since we made these decisions, there has appeared a
product which obviates two of our concerns. At a cost of about
$350, one can now obtain a 1 megabyte RAM disk board. One
megabyte is almost the equivalent of three floppy disk drives,
but access to it is at nearly the speed of memory. The entire
software package and the data for a case could easily reside in
this space, permitting very fast execution and subsequent
one-time copy of the data files to a single floppy disk. We have
not altered our program design in consequence of this
development, but its impact upon the implementation of such

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D. User Characteristics

There are two types of users of our software. The police are the input-
users who enter the data; and the prosecutors are the report readers who
consume the information.   Of the two it was our perceptions of police abili-
ties, motivations and limitations that had the more significant influence on
crucial design decisions.

Our assumptions were that the police users could not be expected to be
reasonably competent typists and that in most police departments there would
be very little or no special training in the use of the program. Therefore,
our software was going to have to be extremely user-friendly and would require
the maximum in user-guidance to be present on the screen at all time. Achiev-
ing the latter meant using both the conventional error-trapping approaches
and also restricting the nature of the input to which the system will react
at any particular point. (In certain situations, for example, all keyboard
activity is intercepted and evaluated, and only permissible keys generate a
response.)

Solving the poor typist problem was a somewhat thornier matter. At
the time, we thought it would be unreasonable for us to assume that all
future police officers should be required to achieve a moderate degree of
typing ability as a standard police skill. (We have since changed our minds,
see below.) Consequently, we placed extreme emphasis on minimizing the
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software needs to be recognized.

amount of typing the officer would do. This was done by the extensive use of "pop-up screens" and by trying to minimize the amount of typing that the officer would have to do in the open narrative section of the report by asking in the form of closed-choice questions much of the information that might go into the narrative. This was a fundamental design error.

E.   Characteristics of the Applications Software

Even before design of the applications package was undertaken, certain requirements seemed clear.

1.   Compactness

The compactness required is a two-faceted issue. First, the programs must be sufficiently compact to leave one of the two floppy disks free on the system for data storage. While it would be technically feasible to prompt the user to change diskettes when required, this was would contribute to unsatisfactory operation, accidental loss of data or programs, user dissatisfaction, and would add to training requirements. Hence we concluded that at least a two-drive system was the minimal hardware practical for this application.

Second, each module of the system had to operate well within the available memory, i.e. enough less than 640K (the upper DOS limit) to leave ample room for data.[5,6]

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[5]. Most systems to which the software is targeted would not have any form of virtual memory management, and the sacrifice in speed associated with moving modules from disk to memory was

2. Speed

Our applications software was going to be "user-response intensive".
When the software is running, a large proportion of the total time is absorbed
by the user reading a prompt; determining in his or her own mind what the
response ought to be; and striking the appropriate key or typing the required
entry at the keyboard. Therefore, it was thought that the software would not
have to operate very quickly in order to stay up with the expected slow
speed of the user.

3. Maintainability

Given that most police agencies are small, it seemed that the ability
of those agencies to maintain and/or modify software with little or no assis-
tance from its developers would be an important consideration.

While many police departments with a computer system have no in-house
person who qualifies as a programer, many others do. With computers prolifer-
ating among the general public, it seemed reasonable that those agencies
which do have such a person available will become the majority in the near

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determined to be acceptable.

[6]. The minimum system contemplated here assumed the
availability of more than a bare-bones operating system. In
particular, the use of a RAM-disk was assumed. Many of the files
to which the system would make frequent reference are copied to
the RAM-disk at start-up, thereby freeing space on the disk
drives and accelerating the access to those files during program
operation.

future. In any event, the ready availability of such services will rapidly increase.

It was therefore considered practical to build software which could be maintained and modified in the field by the using agency, either by its own personnel or by others obtained locally. This implied that the de lopment language should have a widely known grammar and syntax (such as BASIC, see below).

4. User-friendliness

Given our assumption that the police-users could not be expected to be typists every effort was made to develop a program which keeps the user apprised of where he or she is in the process of preparing the case, provides copious prompts and messages indicating what is wanted and how to perform it, and is tolerant of keystroke errors.

F. The Development Language

The language to be used in developing our applications software was BetterBASIC. The following factors were considered in selecting this language.

1. Grammar and syntax

Assuming the future need among police departments to be able to maintain our software or derivative products in the field influenced us to choose a BASIC-like programming language. This was to ensure that the police agencies who adopted our software would be able to make any necessary modifi-

cations to the code with either their own police personnel who were familiar with the language called BASIC or with readily available local programmers.

BASIC (Beginner's All-purpose Symbolic Instruction Code) is the most widely known computer language in existence. There are several versions of BASIC. Each differs slightly from the others; but we thought that a competent programmer would experience little difficulty in making the required transition from one to another. This assumption was only partly right.

2. Incremental Compiler

The original BASICs were interpreters. After the code had been written, BASIC "interpreted" each line sequentially. The lines were converted to hundreds of computer instructions which were then executed. When certain lines of the program were repeated many times, this became very inefficient due to the need to reinterpret each line of code each time it was executed. Easily learned grammar and syntax were achieved at the cost of run-time performance.

This problem was solved by the advent of BASIC compilers. These software tools operate on lines of BASIC code to produce a relatively compact and fast machine-like code. The BASIC compiler solved a problem for the user (size and speed of the program), but it created one for the developer of the software. Specifically, any change in a program, however minor, necessitated a recompilation of the entire program. If the program was small, this was acceptable. A very large program, however, might require considerable time

to recompile. During periods when changes are being made with great regularity
(as occurs during software development), this could represent a major problem.
Also, coding errors were often discovered only toward the end of a lengthy
recompilation. This required the process to be started from the beginning
after correction of the errors. The incremental compiler, such as the one
provided by BetterBASIC, solves this problem.[7]

BetterBASIC's incremental compiler has most or all of the advantages
of both BASIC interpreters and BASIC compilers, with few of the disadvantages.
It permits the writing of relatively fast and compact code in a language
which is familiar to many programmers, and is suited for use by novices.

3. Modularity

The need to be able to bring small pieces of a large program into
memory one at a time for execution makes modularity important. This feature
of a programming language permits creating independent but related "pieces"
of a program, each of which, upon completion of its task, causes another to
be loaded and executed.

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[7]. It compiles each line of code as soon as the programmer
enters it, a process which requires from less than one to a
maximum of two or three seconds. If the line contains errors,
the programmer is so informed at that point, and can immediately
correct and recompile the line. In this respect the behavior of
the incremental compiler is hardly distinguishable from that of
an interpreter. But when the programmer has finished writing the
code, it is already fully compiled. He or she may run the
partially completed program to test portions of it, then proceed
to add more lines. Further, when changes are required, only the
affected lines need to be recompiled.

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A related attribute of the development language has to do with the ability to convert frequently-used code segments into independent entities which can be incorporated into the main program by reference without repeating the code itself at each point where it is utilized. BetterBASIC does this well.

4. Run-Time Machine

A characteristic of most BASICs is that the programming language itself must remain memory resident when BASIC programs are to be run. This impacts adversely upon the compactness of the total system, since it adds to "memory overhead". Worse, it also means that any agency which sought to use our software would have to purchase a copy of the programming language.

A feature of Better Basic solves this problem. It is called a "run-time module." It converts BASIC programs created with the incremental compiler into "stand-alone" code in the form of what is known to MS-DOS/PC-DOS users as an ".EXE file". An .EXE file is an executable program which requires only that DOS be present in memory.

This feature assured that it would eventually be possible to distribute copies of our software to any police agency which had an MS-DOS/PC-DOS computer. There would be no need for that agency to own or purchase any other software.

5. Cost

The cost of the programming language was a consideration for two reasons. The first was the necessity to complete the development project within the available budget.

Of equal importance, however, was to allow for future field maintenance. It is not possible to modify .EXE files created with the run-time module. To implement any change, it is necessary to have: (1) the original program created with the incremental compiler; (2) a compatible incremental compiler with which to recompile the code following modification of the program; and (3 the run-time module with which to recreate the .EXE file from the newly modified code.

Inasmuch as it is to be placed in the public domain, our software itself would be available to all agencies. Assuming that the requisite programming expertise were available, then, an agency would need only the development software (incremental compiler and run-time module) in order to make any desired modifications to the programs. If the development software were too costly, departments would be unable to maintain the programs even if they had access to the required programming expertise. Thus it was thought that the retail cost of the programming language to be used by us should be kept low and hence within the resources of virtually all police departments including small ones.

6. State of the Art vs. Tried And True Technologies

A crucial decision in selecting a programming language (and, for that matter, all the technology involved including the hardware) is the

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choice between using the latest, most advanced technology available or an older technology that has been market-tested and undergone any revisions to remove "bugs" or to improve performance.

The conservative choice is to go with a proven product. But, in a rapidly developing field such as computer technology that may mean building one's system on a product that may be outdated before you complete your fieldtest. It also means foregoing the advantages of new features in the more recently issued products. It means constraining yourself technologically and building in early obsolescence.

However, it also means that you reduce the risk of working with newer vendors who may not have learned how to support their users and the risk of relying on a product that may have unforseen flaws in it. Obviously, the alternative to is go the route with the higher risk and the higher payoff.

We chose the higher-ris route but not without disagreement among ourselves. Yet, even now in the wake of the disastrous problems we experienced with BetterBASIC, we continue to disagree as to what the better strategy is. There is no simple or sure answer.

Choosing the state-of-the-art technology involved a higher risk that in fact went against us. But, in retrospect we do not think our choice was reckless. We consulted a review in a leading trade magazine and we obtained and tested a review copy of the language before committing ourselves to it.

The review of BetterBASIC in PC WORLD (George, 1985:161) was quite favorable.[8],[9]

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8. The review compared BetterBASIC and another new BASIC language against the current "standard" in the world of PCs, IBM's Advanced BASIC (BASICA). The reviewer wrote:

"BetterBASIC is an elaborate extension of BASICA, with many restrictions removed and a vast number of language extensions added.

"BetterBasic is a highly modular system....[It] enables you to add your own modules to the load list and actually create you own custom version of the BetterBASIC language.

"While producing clear advantages, Summit Software's decision to model BetterBASIC on BASICA had resulted in some trade-offs. The most serious is that BetterBASIC still requires line numbers. This restriction is somewhat mitigated by the availability of a range of structured constructs such as DO-END-DO, DO-REPEAT, and DO-IF-REPEAT.

"On the positive side, BetterBASSIC supports a rich set of data types.

"Both [the other BASIC reviewed] and BetterBASIC languages have been designed for ease in coding separate routines or procedures, and both allow procedures to be invoked simply. The support the passing of data to and from the procedures as parameters. BetterBASIC is more sophisticated in this respect, allowing a greater degree of control over the process.

"The BetterBASIC manual is huge (over 700 pages), sprawling, not well organized, and unremittingly technical--on the whole, it's poor.

"Because of its modular nature,, BetterBASIC is the more flexible of the two programs....

"BetterBASIC is slightly more powerful than [the other program reviewed] but it is also more complicated. [It] clearly excels in flexibility and extendability."

II. The Design Of The Case Preparation Software

A. The Approach

The main software design problem was to develop a program that would ask all the questions necessary about a criminal incident but to do so within the limits of the programming language. In addition, the software had to have user-friendly and user-guidance features mentioned above. It also had to generate and format reports for the prosecutor and its access needed to be guarded against unauthorized use.

Our approach was to develop questions about the criminal incident that were universal so that they would be applicable to any and all criminal incidents. These were divided into three mutually exclusive modules in the program. The "Persons" module contains all the questions about all the persons involved in the incident. The "Event" module contains questions about certain things related to the crime and arrest, such as time and date. The "Premises" module contains questions about the place where the crime occurred and questions about vehicles that may have been involved. (See

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[9]. When the problems with BetterBASIC became debilitating for us, we consulted another BetterBASIC user to see if he had similar problems. He was using BetterBASIC in what he described as a fairly complex application in defense work for the military. But he had no problems with it. Evidently, his application did not require the use of certain features or approach certain limits of BetterBASIC as our does.

We also read the (open) letters from other BetterBASIC users on the electronic bulletin board operated by Summit Software Technology (the vendor) for its customers. There we found that we were not alone. There were many highly frustrated, angry users complaining about problems with the software and with Summit's customer service.

Figure 5.1 for a description of the software's components. See Technical Appendix for a print-out of the screens of the software.)

Thus, no matter what the crime is the program asks the same basic questions. It first asks about all the people involved. Then it asks about the circumstances of the crime, the arrest and any searches. Then it asks about the premises where the crime occurred (see sample screens, Figure 5.2).

Within each of these modules there are sets, subsets, subsubsets and subsubsubsets of questions which probe for additional information contingent upon answers to earlier questions. For example, in the Persons module the user is asked to enter the name of a person involved in the incident. Then he is asked whether the person named is: a defendant, a victim, a witness or a police officer. If the person is a police officer, then a set of questions relevant to police officers only is asked, such as their badge numbers, assignments, and roles in the case.

If there are no persons of a certain type (e.g. witnesses) involved in the case, the questions relevant to that type are never asked. After the user responds to all the questions in one module, the program proceeds to the next module and asks the questions in it. (This modular structure in the software was necessitated by the limits of BetterBASIC's data definition (memory) area, discussed further below.)

The specific items of information asked about in the modules were se

Figure 5.1 Final System Flowchart

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Figure 5.2

Sample Introductory Screens

```
        _____
       |                                           |
       |            M A I N    M E N U             |
       |                                           |
       |_____|



     => READ INTRODUCTORY INSTRUCTIONS

        BEGIN WORK ON A NEW CASE

        PREPARE A PRINTED REPORT OF A CASE

        END THIS SESSION



 ↑↓ TO MOVE POINTER                    RETURN KEY TO BEGIN WORK
```

```
              WELCOME TO COMPUTER-ASSISTED CASE PREPARATION

 THE GENERAL IDEA: This computer program you are using is designed to
 help with the preparation of burglary cases. The process of using it
 consists of reading prompts or questions from the screen, then making
 responses or entering answers on the keyboard.

 PICKING RESPONSES: For some information, a list of possible choices
 will appear in a white pop-up window on the right hand side of the
 screen. A pointer, which you can move up or down with the arrow keys,
 will also appear. To make your response, just move the pointer up or
 down until it points to your choice, then hit the RETURN key.

 After you hit the return key, the pop-up window may disappear, in
 which case the next instruction, prompt or question will appear else-
 where on the screen. Or, some new choices may appear in the pop-up
 window. In either case, the screen will indicate what information is
 being asked for.

 In some situations, there may be more choices than will fit in the
 pop-up window. To view the ones not in the window, use the PAGE-UP
 and PAGE DOWN keys. If there are choices above or below the ones you
 can see, they will come into view. If not, a 'beep' will be heard.
```
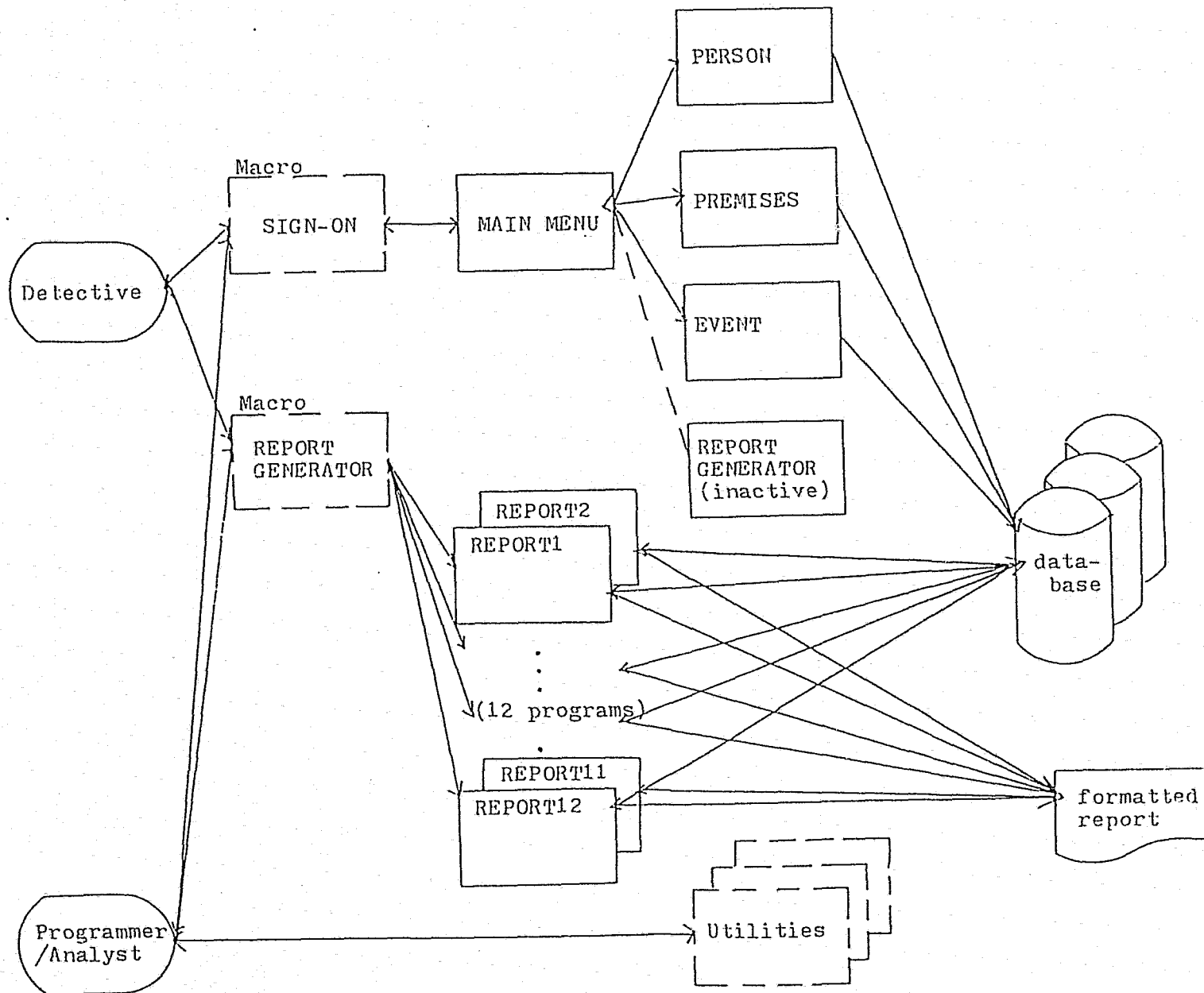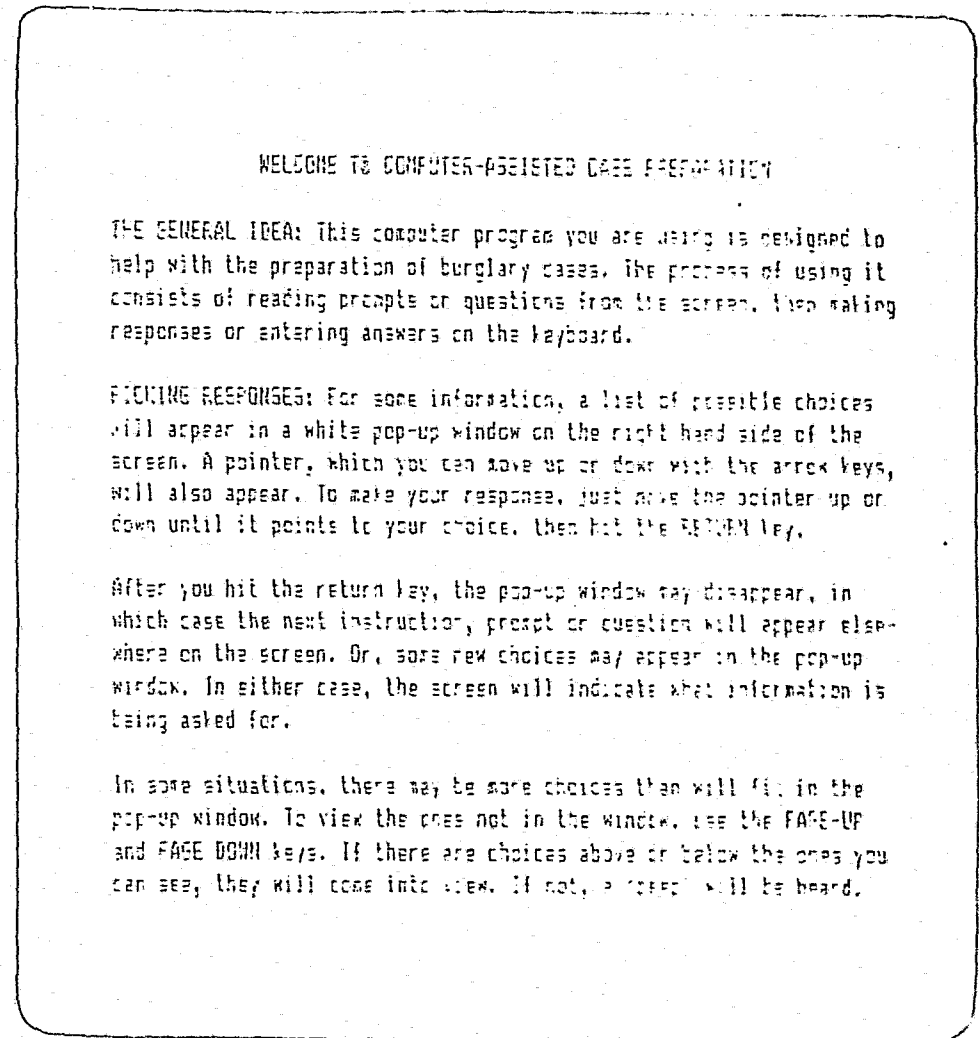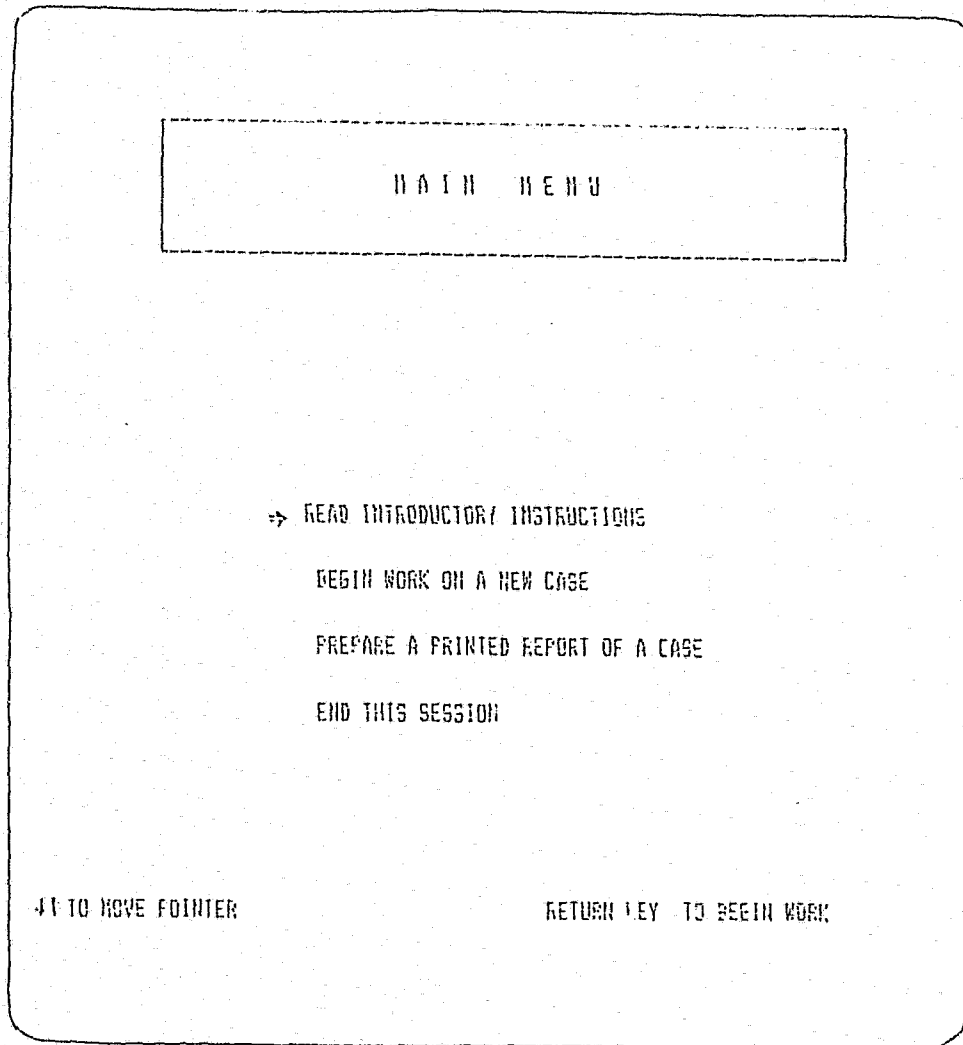
Figure 5.2

Sample Introductory Screens

CASE PREPARATION : BURGLARY

This is a brief introduction to the program that handles data entry
for Burglary (as opposed to other crimes).

The entry of data for this burglary is divided into three categories:
the PEOPLE involved,
the PREMISES burglarized,
and the EVENT of the burglary.

First you will enter the names of anyone associated with this case.
Then enter all information about the burglarized premises and its
surroundings. Finally, you will be asked specific questions about
the facts of the crime and witness testimony.

Hit any key to continue

PERSONS
(This is an introduction and menu for gathering personal information.)
1. You are to enter the names and primary roles of ALL people involved
   in this case. Do this by choosing (A) -- to add each name.
2. Then, each person should be updated to enter specific information about
   their participation in this case. Do this by choosing (U) -- to update
   each person. Each person is updated only one time!
3. Finally, after all names have been entered and updated, choose (Q) --
   to go on to the next section.

!! Enter all participants first, before you update anyone !!

INFORMATION ABOUT PEOPLE
==========================

A -- ADD a new person's name to the file

U -- UPDATE an existing person's record

Q -- QUIT and go on to the Event

Enter Choice: A, U, or Q

Figure 5.2

Sample Introductory Screens

lected based upon our review of the information that is currently asked on the police reports used in Nashville: interviews with Nashville prosecutors about the critical items of information that are often absent or incomplete in reports; and upon our own experience.

B. User-Friendliness and Guidance

The primary method of trying to make the system user-friendly was through the extensive use of the "pop-up screen" facility of BetterBASIC. Whenever questions were asked that could be answered by selecting words or short phrases from a list, a pop-up screen was created. It is a rectangular screen containing the list of possible answers. It partially overlays (in a different color) the screen with the original questions. The user then moves the cursor to the correct choice and strikes the RETURN key. The choice is automatically printed in the appropriate answer space.

In addition, user-friendliness was sought by using the graphics and color coding facilities to highlight instructions and choices for the user, and by providing an extensive set of instructions and prompts to guide the user. Further user guidance was achieved by an error-trapping method. At the end of each screen the user is asked if the information he/she has entered on that particular screen is correct. If not, the screen is erased and the user re-enters the data.

Another feature is that for certain items of information entered by the user (e.g. the names of all the persons and the descriptions of all the vehicles involved in the case) the computer automatically compiles lists

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which become pop-up screens themselves. Thus, at those points in the program where the user is asked such things as who was present at the search or the arrest, the list of all the names of the persons in the case pops up and the user merely points to the relevant names rather than having to retype them.

C. The Prosecution Report

The main design question regarding the prosecution report generated by the software was its format. The key choice was between condensed or extended formats. Condensed reports would have omitted any sections of the report for which there was no information and would have butted each separate section up against the preceding one so as to conserve space.

The extended format prints all sections and begins each new section on a new page. The expected advantage was that this would allow prosecutors to know exactly where to look for certain information once they became familiar with the report format. The disadvantage is that it consumes enormous amounts of paper and spreads the report across several pages.

III. A Chronology Of The Project

A. The Schedule

This project was scheduled for 18 months but took 32. By the end of the first six months we had hoped to be field testing the software for the first crime. By the end of the ninth month we had hoped to have software that included all four crimes being tested. The next nine months were for

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collecting cases prepared by the software, evaluating them and writing the report.

In truth our proposed schedule was a broad estimate. Our system designer and our chief programmer had installed some comparatively simple programs in some law offices before but had not had experience with an undertaking as massive as our project. We based our estimates on their experience and on assurances from knowledgeable people that what we were attempting to do was relatively easy and would be able to take advantage of programming languages that have features directly related to our purposes.

B. Early Delay

As a general rule it seems that substantial delays occur at every point in a project where progress depends upon the actions of people outside the project staff. This is not say that project staff are always as efficient as might be. Rather the point is that in distilling our own experience a general pattern worth noting emerges. Researchers and funding agencies seeking criteria for judging the feasibility of project schedules, should know that project dependency on outsiders is a critical dimension to be wary of.

Delays in our project began immediately. We did not begin with computer and programming software in hand. Obtaining them was not a simple matter of a trip to the local computer store. Obtaining the computer was delayed because IBM discovered a flaw in the model we ordered and after several weeks's delay notified customers that it was stopping shipment on that model (the AT) indefinitely. We then ordered an alternative model (the XT).

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The software was selected after viewing alternative packages and pretesting BetterBASIC. The design of the logic of the program began in the second month but proceeded slowly. By the end of the first six months it was apparent that the job was more difficult than had been anticipated. This was in part due to difficulty of using BetterBASIC. This in turn was due not only to the fact that BetterBASIC uses some different structures than are found in standard BASIC but also because of the incredible inadequacy of its manual.[10]

It is hard to explain to someone who had never written even a simple program how time-consuming and tedious programming can be under the best of circumstances.[11] It is impossible to convey the frustration, exhaustion and self-doubt created when one is using a manual that frequently gives you wrong information or omits telling you some essential information. It can be as simple as forgetting to indicate that a "/" is needed at the end of a line; or telling you to use a "/" when it was supposed to be a "\".

Such errors cause enormous delays. They are not easy to detect. The normal tendency of the programmer is to assume that the manual is correct and the error is in something he or she did. One pours over one's code trying to find the error and only belatedly decides that it might be in the

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[10]. BetterBASIC's manual was criticized in the review we had seen (see footnote above). But this warning does nothing to prepare one for the kind of egregious errors and mistakes in the BetterBASIC manual.

[11]. For a look at the complexity of code see the hard copy of the code for our software in Technical Appendix, Volume I.

manual's instructions. A phone call to the helpline may take several tries and may not yield an answer until the helpline consultant had time to play with the problem himself or check with his superiors.

By the end of the sixth month the software for the first crime had not yet been written and was not expected to be ready for several months. Therefore, we requested and were granted a revision in the project plan. Instead of writing a program that would include four crimes, we would write one for one crime. The reasoning was that if it worked for one crime then its value would have been established in principle, which is all the project was intended to do anyhow.

B. Disaster Strikes

In the eleventh month when the design work was virtually completed; much of the coding was done and we thought we were about to begin the field test, BetterBASIC began refusing to perform certain functions. Much time was spent rechecking our coding and the BetterBASIC manual and consulting with the BetterBASIC helpline at Summit Technology. Eventually we determined on our own that our program had gotten so large that it was exceeding the available data definition area of BetterBASIC (memory area). (The area is limited to 64K.)[12]

By then we had lost confidence in Summit Technology's helpline and decided to try to solve the problem ourselves. Our solution was to divide

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[12]. This discovery was by trial and error. The Summit Technology helpline consultants were not aware of it and it was not specified in the manual.

our one big program into several programs each contained in a separate module. This worked because each separate program could be kept within the 64K limit and because of a special feature in BetterBASIC that allowed you to string several of these modules together. When all of the space in one module was filled, that module would "call" the next module. This happens so quickly that the user is not even aware of it. In effect it allows you to get around the 64K limit of each module but not without a serious cost to the robustness and flexibility of the overall software.

In particular it meant that the features in BetterBASIC that allowed it to be used to partially mimic the capacity of a data-base manager and an expert system, were for the most part lost. Although BetterBASIC is not considered a language for use in building expert systems, in our pretest of it we found that it could be programmed to do internal cross-checking of answers to earlier questions addressed by the user.

Thus in adopting BetterBASIC we had not excluded the possibility of creating the expert systems functions we had intended to create. But, this in effect was one of the consequences of our solution to the limits of Better-BASIC's data definition area. In order to do the expert-systems-type functions (of picking charges and feeding back directions for further investigation) we had planned to use large data arrays. But once the program had to be broken into several modules these large arrays were no longer possible.

Another major consequence for the software of this patchwork was to make the program less user-friendly. There are many questions in our final

program that ask repeatedly for the same basic information such as the time
and date when something occurred. Those questions could have been made much
easier to answer. If our module solution had not had to be used, the computer
could have taken the taken the user's first answer and used it as the presump-
tive answer at every subsequent query. The user could take the presumptive
answer as the default answer rather than typing the same information in
repeatedly as now must be done.

Still another drastic consequence of our module solution was that it
meant starting all the coding of the program over from scratch! The existing
code could not simply be cut into separate modules. This meant that instead
of being ready for the field in a few weeks the program would not be ready
for an additional several months.

C. Miscommunication

At this point one might have considered several alternative courses of
action including switching to a different programming language; switching to
a different programming team or even terminating the project. However,
such alternatives were not discussed at that time among the three principal
staff members because the system designer evidently felt that the chief
programmer's estimates of how long it would take to do the recoding were
excessive and also thought it best to encourage the project director to
believe that the end was at hand.

He persuaded the chief programmer (his former associate who was awarded
this programming subcontract because of her prior programming work with him)

to join him in this strategy. The project director was told that a problem with BetterBASIC had developed but was not appraised of its seriousness or its implications for the project schedule or the quality of the software. He was not until over a year later when the project was over and the final report being prepared that the scope of the problem was clearly explained to him.

Unable to make an independent judgment about the progress of the coding, anxious about the serious delays and operating under the assurance that the program should be running by the end of the thirteenth month (December), the project director decided to place the computer equipment in the field just before the Christmas vacation began. Under the impression that the software would be ready to use by the first week in January, he did not want to lose any start-up time in shipping and setting up the equipment. He also thought that this drastic step of putting the equipment in the field would motivate the staff to finish the final coding as quickly as possible.[13]

D. The Long Wait

At the end of the first week in January the program had still not arrived but it was going to be there "early next week". The following week it did not arrive but was just about ready. Then it was reported that a new problem with BetterBASIC had been discovered. For the next couple of weeks the report from our system designer was that Summit Technology was trying to

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[13]. The chief programmer had her own personal identical computer equipment at her office in Florida. So she could continue programming even after we placed the project's computer in Nashville.

fix the new problem. Eventually, the system designer went to Summit Tech-
nology headquarters in Massachusetts and spoke to President about getting a
solution to our problem and better support from them on the helpline.

A week or so passed while we waited for Summit Technology to send us a
special fix they had prepared just for us. When it arrived it solved one
problem but created new ones that had not been problems before. When the
new problems were reported to Summit, they told us that release 2.0 of Better-
BASIC was about to be issued; that it solved all the of the problems in the
1.0 versions and that we should wait for it.

The announcement of the pending release of version 2.0 of BetterBASIC
came in February. Our chief programmer did not receive a copy of it until
March. Meanwhile she had continued her solution to the original problem of
the limited data definition area. Using the original version of BetterBASIC
she continued to recode the originally coded material into modules and also
to write new code for those parts of the program that had not been coded when
the original problem had been found.

She had proceeded on the reasonable assumption that version 2.0 of
BetterBASIC would permit upward compatibility with the earlier version that
she was using. However, when version 2.0 arrived the crucial feature that
her solution depended upon, namely the ability of one module to call another
module, had been eliminated. Moreover, version 2.0 did not solve the problem
of the limited data definition area (the limit was still 64K); and, the new
manual was as nightmarish as the original. It was loaded with errors and

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omissions. Commands had been changed. It was like using a new programming language. Things that had worked in the original version did not work anymore. When she tried to convert all of the code she had written into version 2.0, everything collapsed.

Frustrated and disheartened not only with BetterBASIC but also with the fact that her professional judgments had been overruled to the detriment of the project, she began rewriting everything in version 2.0. She indicated to the system designer that she wanted to terminate her relationship to the project. He in turn reported to the project director that it seemed we had better get a new programmer.

E. The Dilemma of Proceeding

The project director was finally able to have a quasi-candid discussion with the programmer about the problems with the project. The questions he addressed were whether to go any further with BetterBASIC, whether to switch to a new language and start over, to switch to a new team, or to terminate the project. He contacted several private software development firms that were interested in doing the work, but they wanted substantial consulting fees just to review the work that had already been done.[14]

There was not enough money to start over (or to be worth terminating) and the programmer reported that if she could be given help with the coding

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[14]. Their fees were "substantial" only in the relative sense of eating up a large proportion of the project's remaining budget. This would have prevented using that money for yet another alternative, the one that was eventually taken, namely to hire an additional coder.

she thought she could get the software written by the May target date that

we were now discussing. So she was allowed to hire an assistant programmer.

The coding proceeded comparatively rapidly. Modules were created.

However, since version 2.0 did not provide for a way to chain the modules

together yet another solution to this new problem had to be found. This

solution also degraded the performance of the software. It causes short

waits at the points in the program where the module has to be written to disk.

The new target date was intended to allow for at least a month of field

testing, training and refining to be done by the system designer before the

project funds expired and he left the field.[15] However, delays continued to

occur partly because of the difficulties for the new programmer in learning

the new language and also because of the problems of communicating and ship-

ping materials between three different cities in two different states and

because of differences of opinion between the system designer and the chief

programmer over details of the code.

F. The Changing of the Guard

By the last weekend of the system designer on the project we were still

waiting for a complete version of the program to run altogether for the

first time. It did not arrive.

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[15]. At one point we considered moving the project to the
system designer's hometown so that he would be able to continue
to work on the project after the funds were expended. However,
the hometown police department was not receptive to the idea and,
upon reflection, the project director that such an arrangement
would not have been in the interests of the project.

The new plan was for the project director to go to Nashville when the program was ready; install it; train the police in its use; and leave it there for several months to collect data.[16] At that point the programmer called to say that her physician had advised her that the stress of the project was seriously jeopardizing her health and that she had to have time away from the computer.

G. Pyrrhic Victory

Finally, in August she was able to return to work. A first draft of the total program (except the report generator) was finished and shipped to Nashville. At 11:23 am on August 23, 1987 our program actually lighted up the color monitor and blinked its way across the pages of law enforcement history.

We were euphoric. The program looked good on the screen. Training of police officers began immediately. The police officers who were trained on it liked it and were not reluctant to learn how to use it. They seemed to learn the basic logic of moving through the screens fairly quickly (within a 30 to 60 minute training session).

However, it was obvious that our plan to install the computer in the Case Preparation Unit's offices and to have those supervising officers train all incoming officers in the use of our computer was not feasible. The

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[16]. The chief programmer could not do this because she does not fly.

training was best done on a one-to-one basis. It took at least 30 to 60 minutes to get a general sense of how to work the program. A neophyte at typing and computers would need even more time to practice. The supervisors could not afford that kind of time and they pointed out that the officers themselves would not be able to devote that much time just to being trained, much less type in their reports.

The new plan was to leave the computer in the Burglary Division's space and just have the burglary detectives use it. So the computer was set up in a general purpose room near the Division and we began training the burglary detectives. We trained 10 officers and one of them was given the responsibility of training the rest of the Division. The captain of the Division assured us that he would have his detectives use the computer.

Two days after the project director returned to Washington, D.C., he received a call saying that the program had gone into a loop and would not respond. The system had to be shut down until he could return to Nashville to repair it two weeks later.

H. Delay in the Field Use

Three weeks later the project director was back in Nashville to install the final component of the program, namely the report generator (the 12 program modules that take the information that the user has entered in a case and produce a formatted report); to demonstrate the software at the Annual Meeting of the International Association of Chiefs of Police; and to get the detectives to use the computer more.

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In his telephone checks with the captain of the Burglary Unit he had learned that very few cases were being entered. The explanation for the non-use was unclear. The captain of the Division had said that he had ordered the officers to use the program and was under the impression that they had been doing so. But the captain was also concerned that until then the computer had not produced any hard-copy reports (because until then the report generator modules had not been programmed and installed). When he saw the reports that were produced by the newly installed report generator he was so pleased that he said he wanted to continue using the computer after the project was over even though it would only produce burglary reports.

We did not leave the report generator activated in Nashville when we left. That is, detectives who used the program would have enter reports without being able to obtain hard-copy versions of them. In retrospect this was a mistake. It contributed to some extent to the ultimate non-use of the program. We should have been more sensitive to the officers' need to get something for contributing their time and effort to entering cases for us.

The report generator was not left activated because it would have added a small but significant complication to the use of our program. We did not have time to integrate the report generator modules into the existing overall program. Therefore, instead of operating off of the menu in the program (as originally planned and where one of the options is "print report"), the report generator is operated by a separate command that is given outside the program. To anyone with elemental knowledge of the computer this is not a

problem if they are forewarned. But, for a computer program that was going
to be used by people who were going to be trained by people who were novices
themselves, it seemed too much to ask.

Moreover, there was no plan to actually use the reports that might have
been produced by our program as actual reports to be included in the files
sent to the prosecutors. (The planned use was for our evaluation purposes
only.) As far as we could imagine, if the report generator had been left
activated and some set of directions left on how to use it, the reports it
printed would have simply been for the interest of the detectives. This was
weighed against the risk of them accidentally giving the wrong command and
disabling the system.

Between October 1986 and January 1987 the captain continued to report
that he was telling his officers to use the computer but that usage was very
light. Our target was 50 cases. He estimated that there were less than
ten. He suggested that the low usage was due to the fact that the Nashville
Police Department had served as host to the IACP meeting, to the holiday
leave-time being taken and to the unusually heavy demands of the detectives'
time. But, he felt that things should get better soon. We were told we
could check with a sergeant who occupied the same office where the computer
was set up and who had been given the responsibility of training new users
on it. In late January the sergeant reported that use of the computer was
beginning to increase. By the end of February he reported that more than 30
cases (our revised target number) had been entered.

I. The Next Set Back

During the spring semester break in early March the project director
went to Nashville expecting to finally print the experimental cases and
deliver them to the prosecutor's office for the evaluation. Given the record
so far, he should have been prepared for the next disappointment. The 30
cases that had been entered were unusable. In any event most of them had
been entered by the sergeant in a well-intended gesture to help out the
project. A few had been entered by other officers but parts of the report
had been omitted or improperly recorded.

There had been virtually no training of detectives beyond the ones
originally trained by us. The program had been virtually ignored and there
was no hope that things would get better if the program were left in Nashville
for another six years. Our hosts had been polite and tolerant and patient
with our project for over a year. It was unlikely that had we appealed to
the chief to order even greater cooperation that we would have met with much
sympathy.

We notified the National Institute of Justice of the situation and got
approval to reduce to the evaluation to the interviews and observations that
we were able to do and to our greatly scaled down version of the quasi-experi-
mental design that we have described earlier.

J. Delay with the Prosecutors

We then produced experimental and control case files for three cases
that we entered into the computer ourselves using existing files from the

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Burglary Division. Twenty sets of these three cases (10 experimental and 10 controls) were distributed to prosecutors for their evaluation in mid-March.

In the first week of June the project director went to Nashville to collect the evaluated case files and interview the prosecutors who had used the reports generated by our program. At that time only half of the prosecutors had returned their completed evaluations. Our liaison person promised get the rest of the prosecutors to complete the evaluations and to send them to us the week following our return. As of July 28 and dozens of phone calls later, two prosecutors had still not completed their evaluations and none of the additional evaluations that were done had been forwarded to us.

Finally, on August 4 the remaining evaluations arrived and the data transfer and analysis began.

CHAPTER 6

THE EVALUATION

I. Process and Impact

This evaluation consists of both a process and an impact evaluation. The

process evaluation is based on our experience in all aspects of this project

from designing and staffing it to selecting, implementing and evaluating the

technology. Its purpose is to give an account of what happened on this

project not only to place the impact analysis in a larger context but also

to identify and critique the underlying assumptions and the decisions taken

regarding the overall purpose and implementation of the project. The value

of the process analysis lies in its contribution to the knowledge-base re-

garding projects such as this involving microcomputers applications in law

enforcement.[1]

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[1]. Microcomputers are coming to law enforcement at a rapid
pace. In the recent round of research proposals submitted to the
National Institute of Justice's Apprehension and Prosecution
initiative three of twenty proposals involved the use of
microcomputers and expert systems or database managers. Over 20
companies are currently selling microcomputer products to law
enforcement agencies. Other products are being produced by
individual police officers using their knowledge from home
computers to solve job related problems. NIJ has funded other
microcomputer applications in law enforcement. One notable one
with which we are directly familiar is the St. Petersburg Police
Department's project in which all patrol officers have been given
lap held computers programmed to take the initial information in

It may be that microcomputers will equal the telephone and the automobile in their revolutionary impact on law enforcement; but, before that can happen a fund of experience will have to accumulate. Some blind alleys may be taken. But, hopefully many can be avoided by consolidating what we learn from early experiences.

Most of our experience with attempting to improve law enforcement with a microcomputer application has been based on the software which we developed and tested. In addition we had direct albeit brief looks at four other computer applications: the St. Petersburg Police Department's lap-held computers; the Garland Texas Police Department's mainframe computer; and the Rockville, (N.Y.) Police Department's ALECS program in which the police enter their reports directly on the computer; and, Coastal Computer System's untested expert system for selecting criminal charges (to be used in tandem with the ALECS system which was written by Coastal and which operates on a minicomputer).

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a general police report.

The International Association of Chiefs of Police supplied the following partial listing of vendors: Mark Systems, Redwood, CA.; INSLAW, Washington, D.C.; DataSystems Northwest, Bremerton, WA.; Micro-Base Corp., Dayton, OH.; Syntax, Kent, WA.; Command Data Systems, Dublin, CA.; Automation Counselors, Frederick, MD.; IPTM Jacksonville, FL.; CISCO, Pasadena, MD.; Provincial Systems, Huntington Beach, CA.; Designer Software Consultants, Ft. Worth, TX.; Applied Management Corp., Helena, MT.; Cogebec, Montreal, Quebec; Enforth Corp., Cambridge, MA.; Law Enforcement Data Systems, Peoria, IL.; SCANTRAK Corp., North Haledon, N.J.; NCSI Rockville, MD.; CSTI Wauwatosa, WI.; Public Safety Systems, Gaithersburg, MD.; Foresight Systems, Lawrence, KS.; OBC Public Safety Division, Dayton, OH.; and Coastal Computer Systems, Long Beach, N.Y.

The underlying assumptions of our software decisions and a chronology

of project events were presented in Chapter 5. The evaluation below is a

critique of those assumptions and decisions in search of guidance for future

efforts of this kind. Also presented is the evaluation of the impact of the

software on the intended users.

II. The Process

A. Cost

The emphasis in the present project on producing an inexpensive software

system was misplaced and self-defeating. It influenced the choice of the

hardware and the software and in so doing placed unnecessary constraints on

the options available.

Producing high quality prosecution reports is a vital function of the

police and it should be funded at a level commensurate with its importance

as are other important functions such as patrolling in squad cars.

B. Typing/Computer-User Skills

The assumption that the police should not be expected to be reasonably

proficient typists wrongly accepted the status quo and perpetuates the classic

mismatch between police tasks and police skills. The police are in the

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information collection and transmission business and they should be expected
to have the skills and technology appropriate to that task. They are required
to know how to handle firearms which they rarely used. But they are not
required to know how to handle a typewriter although they write 20 reports a
week.

The assumption also wrongly underestimated the willingness and ability
of the police to learn this skill (and the extent to which many of them have
already developed some facility at it).

The police in Nashville, St. Petersburg, Lynbrook and Rockville, New
York[2] willingly accepted the challenge of learning to type on computer key-
boards. The Nashville detectives were already familiar with using computer
terminals to do record checks.

The assumption that the police could not be expected to type led to two
drastic design flaws: the over use of pop-up screens and the attempt to
virtually eliminate the need for a narrative section of the report by the
extensive use of short-answer questions. Both measures made the program
extremely tedious and unfriendly; and, in the end it was impossible to dis-
pense with the unstructured narrative section which the officer had to type
by him/herself.

1. The Pop-up Screens

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[2]. The New York cites are where the ALECS program is
operating (Unnamed, 1986; Mattura, 1986).

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Instead of designing screens as simple templates into which the respondent would type the required information in the space provided, we attempted to minimize typing by the use of "pop-up screens". For instance, when our software asks for an address, the police officer does not have to type in the word, "Nashville". Instead, a screen pops up containing the names of Nashville and all the other surrounding towns within the jurisdiction.4

The police officer only has to move the flashing arrow (cursor) on the screen to the correct choice and hit the ENTER key. The name will be automatically entered into the report. This not only saves the trouble of typing but also assures that the word will be correctly spelled.

This seemed like a perfect solution to the problems of typing and spelling. It seemed to anticipate the most "obvious" objection to the use of our software. If anyone claimed it would not work because some police officers cannot type or spell, we would be able to retort that the marvels of computerization had antiquated the need for such primitive skills. An officer would not need to do anything much more than "point and click".

It sounded so wonderful in theory; but in practice the hidden problems emerged and have convinced us of the wisdom of approaching all computer solutions and their advocates with a great deal more skepticism than we did.

There are many unseen costs and pitfalls in computer solutions. For instance, it may be true that police officers do not have to be excellent typists in order to use the computer. But it is certainly not true that the need for a minimum degree of typing skill and familiarity with the keyboard can be circumvented by clever programming. All computer solutions that require manual (typed) input (as opposed to the voice-activated systems of the future) will require some minimal skill at using keyboards.

Instead of using our pop-up files it often would have been faster, easier, and less confusing overall, if we had simply allowed users to type many short items directly into the report. Some pop-files require more keystrokes to insert an answer than would have been required to type it in directly.

For example, one pop-file lists the words: "Street"; "Avenue"; "Highway"; "Pike"; etc. In most cases the officer could have typed in the answer in three strokes, e.g. "St." But using the pop-up file may not only require that he/she use five or six strokes to get to the correct choice, but also requires that he/she use the cursor keypad. This means lifting one's hand away from the main keyboard area and then having to relocate your fingers on the correct keys when you return to the main keyboard area. All of this is not only less than efficient, it is outright annoying.

Some of these inefficiencies might have been remedied if we had more time to field test and revise our software. But there was a limit to the increase in user-friendliness that such revisions would have achieved. More

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importantly, if we had eviscerated all of the marginally efficient pop-up files, we would have defeated one of the main reasons for choosing Better Basic as our programming language.

We would have been far more successful if we had tried to be less helpful to the user and just created electronic templates of the basic police report forms and had the police type in the information and type a narrative at the end. This in fact is how the ALECS system operates and the police in Lynbrook and Rockville, New York have found no difficulty in typing the missing inform-ation and the narrative.[3]

We considered this approach but rejected it not only because of our assumptions about the need to help the police type their reports but also because it did not go beyond the existing police report form. It did not branch and probe with contingent questions as would a live prosecutor.

2. The Narrative

There are two components to police reports: the analytic and the synthetic. The analytic component refers to all of those sections of the various documents that consist of answers to specific questions, such as time and date of arrest; age, sex, race of defendant; etc. The synthetic component refers to those narrative sections of the reports that give an account of what happened, usually in chronological order.

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[3]. We do not know whether the ALECS system has increased the amount of information transmitted by the police to the prosecutor; and we did not interview prosecutors for their opinion of ALECS. But we did speak to the police and they are quite pleased by the system.

Both types of information are critical to have but each performs different functions. Prosecutors tend to regard the narrative as the primary source of information about the case. A quick review of the narrative gives them a sense of the whole and a sense of the credibility of the account. The narrative sections are even more crucial in jurisdictions like Nashville where there are prosecutorial screening operations and case-related communications between police and prosecutors are virtually entirely based on the case reports.

We attempted to minimize what would have to be typed in the narrative section of the report by maximizing what was asked about in the question-and-answer section of the report. The prosecutors who used reports produced by our program were happy to have the more thorough short-answer section and did not think it was unreasonable to ask the police to respond to all those short answer questions (which far exceeded the number of questions asked on a usual police report and which we ourselves now think are too extensive). But prosecutors were unanimous in the importance they place on the open narrative section of a report.

3. User Friendliness

Achieving a high degree of user friendliness in any software application is an important goal which most users would probably say you can not get enough of. However, it is possible to go for more user friendliness than is necessary. We made this mistake because of our underestimation of the police capacity for typing. In contrast, the ALECS program which did

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not assume the police could not type, has virtually none of the fancy color coded screens and boxed materials that our program has. Yet, the police have no problem using ALECS.

C. State of the Art v. Proven Technology

Although we disagree among ourselves, two of the three of our principal staff members believe that it is a mistake in projects such as ours to adopt the latest technology rather than going with proven materials. The problems of developing, field testing and evaluating software are great enough without adding additional risk and delay associated with unproven technology. Even if the new technology performs flawlessly its use imposes substantial start-up costs involved in learning its use and in solving all problems oneself.

D. Start-up Time

Purchasing, assembling, and configuring the hardware and learning the new software (BetterBASIC) delayed this project far more than was expected. Future projects of our kind whose schedules are dependent on access to computers should have the equipment in place at the outset and should only use software that the staff has already learned.

E. Staff Qualifications

Computer applications to substantive areas such as law enforcement require the blending of different sets of expertise. The staff necessarily has to combine the technical expertise of the software developer and the

technical expertise of the law enforcer. But someone has to be ultimately in charge.

Our project gives no clear guidance as to whether it is better that the person in charge be the one with the computer expertise or the substantive (law enforcement) expertise; nor, does it give clear guidance as to the requisite prior experience of the staff. However, prior experience in software development of the magnitude involved in this project might have led to more conservative judgments about the design and language choices.

Also, it is essential that projects developing software have some impartial external software development consultant review the project plans, schedule and progress for the purpose of providing both the senior project staff and the funding agency with an independent judgment about the feasible, progress and quality of the software. Writing software is not like building a wall where the layman is not dependent upon the bricklayer for a judgment as to whether things are going as planned.

F. The Field Test

The cooperation that this project received from the Nashville Police Department and the District Attorney General's Office can only be described as excellent. Both organizations welcomed the study and agreed to full cooperation. They both made time, personnel and space available to us.

We do not want to seem unappreciative or unreasonable. However, at one level cooperation was hard to obtain. It became impossible to get the detec-

tives to use the computer; and it took months to get the prosecutors to return their evaluations of the cases.

From interviews with detectives it appeared that five conditions discouraged their cooperation. They were not trained on the equipment and feared causing it to break down. Those who used it found that the software was tediously demanding and time-consuming. To do a complete report took us about two hours even after we had developed some facility with using the program. Manually produced reports can be produced in about one hour.

The two hours or so that detectives would have had to spend entering a case on our machine would have been time out of their daily schedule for which they had nothing to show. They could not get a hard copy of the report they entered because we did not supply them with the necessary command to print the report.[4] They pointed out that if a computer program to assist in case preparation is ever to be successful it must not duplicate the report writing of the police. They also noted that our computer had been located in a high traffic area where it was hard to concentrate.

The fact that we did not have a staff member on location to respond to these concerns clearly contributed to the failure of the field test.

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[4]. Originally the software program was to include a simple optional command that would have printed a report. However, when the report generating programs were finally added to overall program we had no time to integrate them into the main menu as planned. They have to be run off of separate command which we decided not to give the police because of the possible confusion it might create.

III. The Impact

A. Methodology

Because of the project difficulties and the minimal use of our software by the police, the design of our impact analysis had to be compromised. In its revised form it consists of three parts: a quasi-experimental design which measures the impact of the computer-assisted case report on prosecutors estimates of the quality of the case report and the likely disposition of the case; interviews with police and prosecutors regarding their assessments of the value of the reports produced with the help of the computer; and our judgments based on field observations regarding the merits of our software and the principle behind this project.

The general hypotheses were the following: that case reports which were enhanced by the presence of the computer-assisted reports (in addition to the usual manually produced reports) would be rated as being more informative and likely to result in a more severe disposition than the non-enhanced reports; that police would find our software easy to use and would prefer using it rather than writing reports by hand; and that prosecutors would find the computer-assisted reports clear and easy to use as well as more helpful for prosecution purposes than the traditional manually produced report.

B. The Quasi-Experimental Design

    1. The Experimental Variable

Two sets of three burglary cases were prepared. The "control" set consisted of the original manually-produced police case reports. The "experimental" set consisted of the exact same documents plus for each case a special report produced with the assistance of our software. Each of the three cases involved burglary charges and each had been originally written by different police detectives.[5]

It must be pointed out that under the revised design the nature of the potential impact of the computer-assisted case report **is limited to the impact of the _form_ of the report rather than to any possible increase in information content.** That is, the experimental case reports contained no more information in them than was contained in the original manual reports from which they were copied! This is because the computer-assisted reports used in this part of our evaluation were prepared by us and not by the police officers who reported the cases. This compromise was necessary because the case reports that police officers produced with the assistance of the computer were not usable.

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[5]. Neither set of case reports contained the special report forms prepared by Nashville Police Department's Case Preparation Unit. A comparison against that standard would not have been appropriate for our purposes.

That is, we wanted to compare our software's case reports with the kind of manual case reports that one usually finds in most other police departments, the kind of departments that were to be the beneficiaries of our software. The question to be answered was, "How much better would a computer-assisted case report be compared to the manually produced reports that are done in most jurisdictions?"

2. A Confounding Variable: Case Fact-pattern

Although the three cases were all charged as "burglaries" in the police reports, they differed substantially in their fact-patterns and, hence, their evidentiary strength. In the original impact design these differences among the cases were to be controlled statistically so that the impact of the experimental variable could be measured. However, that design assumed there would be a total of 100 cases for analysis (50 "before's" and 50 "after's" from the same police officers). With only three cases we were unable to adequately control for differences between the cases (although some limited controls were used in the analysis). Consequently, type of case became the main explanatory factor in the analysis, as shown below.

Presented below are the narrative sections of the primary documents in each of the three cases. The names and dates have been altered but everything else including misspellings and most of the formatting is virtually identical to the original except that it is typed as opposed to handwritten.

Case # 1

Supplemental Report from Det. X.:

On 10-6-85 at 13:35 Sgt. CT broadcast that he was behind a vehicle heading south on I-75 and was attempting to stop vehicle for registration violation. Vehicle pulled off I-75 at W. Finity Ave exit. Vehicle was stopped near Brook Church Pike. Registration came back to a Lincoln. Auto was a 1975 Pontiac, color blue, TN Lic. [number]. Vehicle was occupied by two MB's. As I arrived, I noticed the trunk was open to Pontiac and the two MB's were separated into police cars.

In the trunk, I noticed an RCA Color T.V., a shotgun, and a rifle with a scope. I.D. was called. I did not ask any incrimin-

ating questions to either MB, other than their names. One MB
stated his name was Abe Haurence. This later proved a lie. His
real name is John C. Brown. D.O.B. [deleted], an escapee from the
TN State Prison [prisoner number] (since 1977). He was later
booked as an escapee.

Photos and prints lifted by I.D.. Inside trunk of vehicle was
also located a stolen TN Lic. Plate [number]. Vehicle towed.
Both charged with concealing stolen property. On 10-6-85 at 15:00,
car 77e, Off. XG was called to a residential burglary at the home
of SI, [address]. I heard the call & asked Off. XG to advise me
of the property taken from victim's house. Shortly, Off. XG stated
that victim was missing an RCA Color t.v., an antique shotgun with
burns or the stock and a rifle with a scope. All property I.D. by
victim as his in rear of C.H.Q. Warrants issued for 2nd Deg.
Burglary on each MB. Defendant KMQ also had various traffic war-
rants outstanding.

General Report from Officer XG:

[Victim's name and address]. Victim states that he returned
from working in the fields to find his house broken into. There
was no witness'. I.D. was called to the scene. Victim will prose-
cute. Taken was (1) one Remington 20 gauge shotgun with scorch
marks on stock. (2) one Winchester 30/30 rifle with scope. (3) RCA
19" portable T.V. color. (40) misc. jewelry.

Affidavit in support of the burglary warrant sworn to by Sgt. CT:

This subject was driving a blue cm veh that Det. WI had advised
me to watch out for involved in home burglaries. I stopped this
vehicle and it had t.v. $ guns in it. Further investigation re-
vealed victim and he is signing warrants. Victim asked me to fill
in this form. [signed Sgt. CT]

<div align="center">Case # 2</div>

General Report from Officer UX:

[Victim's name & address etc.] Victim states that as he was
pulling into the driveway he saw a small white care backing out of
drive. The white car was being driven by a m/w app 18-21 yrs of
age. Victim states that when they meet in drive the suspect eh cut
through the grass and went around him. ID not notified because of
lack of physical evidence. Victim states that he will prosecute.
Items taken to be called in.

Supplemental Report from Officer SX:

8-4-85 1400 I talked to Mr WX after having made several
attempts to reach him and he stated that his home was entered
around 1700 on 7-29-85 by a MW who was driving a late model small
white car. Mr X could not give an accurate description of suspect
but did say he was MW app 21 yrs old. He could not obtain a lic
number.

        missing
1 RCA video tape recorder
        model VPP92s
        ser 4353355
1 RCA video tape recorder
        mod vctt500
        ser unknown

Supplemental Report from Det. XFC:

9-2-85 This date I showed a photoline up to a Mr. WX. He
had seen the suspect as he drove out of his driveway. The victim
picked out suspect HFE. The photo line up consisted of the follow-
ing photos. [name, ID numbers and dates of six defendants].

I obtained a warrant on D and served it on him along with
Det. G.

Warrant # [number] (2nd Degree Burglary)

Photograph Identification Form from Det. XFC:

[Identifies photos in array, date, time, signature of person
making identification, i.e. the victim Mr. WX]   Pointed to #5
[photo of defendant HFE] and stated that's him.[6]

Arrest Report Form from Det. XI:

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[6]. Note that at the time of the crime the victim had
reported that the suspect was approximately 18-21 years old but
defendant HFE was 35 years old.

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[Name, address etc. of defendant].   Suspect was picked out of
a photo line up by victim WX.[7]

Case # 3

Supplemental Report from Det. ES:

On 7-1-84, about 4:00am, the dispatcher called me at home and
advised me that a suspect was caught in a building at [address]
and patrol requested a detective. I arrived on the scene about
4:30am. Offs. L and Q and Sgt. X were at the scene. Officer Q was
the first car at the scene and she arrived at 3:38am. Richard Roe,
church development director, [address and phone], was also at the
scene. One of the plate glass windows, facing Maple St, was broken.
I was advised by Off. L that the suspect broke this window on the
way out. A plexiglass window, beside the broken window was damaged
from the outside. This is the window that had been replaced since
the burglary last week. On the opposite side of the building, by
the parking lot, a plate glass window was broken and a window
inside the reception area was also broken with a large rock.

On the sidewalk, on Maple St, near the broken window, was a
brown leather Platt suit case containing a General Electric cassette
recorder, NCR calculator, Unimark Digital clock radio and an Ambas-
sador leather shaving kit.

The suspect told Officer L that he was staying at [address].

ID Officer G came to the scene and photographed the entire
area. He also dusted, the items in the suit case, for prints.

Mr EM showed me where each item came from. The suitcase was
in Mr ME' office and the suspect emptied the contents on the floor.
He then loaded up a clock radio and the shaving kit from Mr EM's
office. The tape recorder came from another officer and the calcul-
ator was in the reception area.

I then went to the Booking Room and talked with Officer Z.
Officer Z discovered that the suspect's real name is GMD. At
5:40am, I read Mr D his rights and he signed a waiver of rights

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[7]. Note that one has to infer from all of the papers in this
case that defendant HFE was already in custody for some other
unrelated crime at the time of the serving of the warrant this
case. This inference has to be made on the basis of item # 19 on
the arrest form where the location of the arrest is given as the
Criminal Justice Center (where the lock-up is located).

form. He stated that he had not been drinking or taking drugs but
he was high on life. He admitted breaking the window. He also
stated that he made a mistake but he needed the money for his
kids. He stated that he should have broken into his wife's. he
then state that he would not answer any further questions. He
just wanted to sleep.

Supplemental Report from Officer Z:

On 7-1-84 at 0344 I was dispatched to [address] on a burglar
alarm. When I arrived [patrol cars] 75ce & 77ce had already checked
on the scene. I pulled around to the south side of the building.
When I got out of the car I heard glass breaking on the other side
of the building. I ran to the north side and found 75ce had caught
a male black coming out of the building. The subject was carrying
a large brown suitcase. The subject did not resist when he was
put under arrest.

I searched the building with 71ce & 77ce. We found the offices
on the second floor had been opened and searched. The items taken
from these offices are unknown at this time.

The subject caught coming out the window was advised of his
right immediately after being put under arrest [date & time], by
Officer XZ 75ce.

General Report from Officer Q:

On 7-1-84 at 0330hrs suspect DE threw a large rock thru
plate glass windows at [address]. Sonitrol reported alarm at
0338hrs and I arrived at 0340hrs. covering the south end of build-
ing. Off. Z covered the north side of building. At this time
suspect kicked out plate glass window on north end of building and
exited carrying a brown bag containing an adding machine, a tape
recorder, a radio and a smaller brown bag. Suspect placed under
arrest by Off. Z as he exited building. ID notified.

3. Control Variables

Below is a listing of the other variables that were coded for each
of the three cases:

A. Characteristics of Prosecutors Who Evaluated the Cases:

ID
Age
Years prosecuting experience
Sex

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Number of burglaries disposed of
Attitudes: agree/disagreement with following:

> Society has to worry more about the erosion of constitu-
> tional protections and civil liberties then about crime
> in the street.

> Crime in this community could be controlled more effect-
> ively if the police provided prosecutors with better-
> prepared cases.

> The primary responsibility of prosecutors is to ensure
> that serious criminals are punished.

> If a prosecutor believes a defendants is guilty but also
> believes that the crucial evidence is not admissible,
> he/she should seek conviction through plea negotiations.

> Generally speaking, in Davidson county Criminal Court,
> the state gets more than it gives in plea negotiations.

B. Characteristics of the Case:

Number of non-police witnesses
Was physical evidence recovered
Value of property stolen/damaged
Type premises
Victim-offender relationship
Was someone on the premises when burglarized
Someone injured
Number codefendants
Race of defendant
Age of defendant
Defendant confessed
Defendant statements other than confession
Was lawful owner of premises identified
ID Unit called
ID Unit results are reported
Crime occurred "at night"
Defendant carried gun
Number officers who prepared the report
Defendant carried weapon other than gun
Fingerprints matched
Point of entry described
Arrest was via service of a warrant
Positive ID of defendant, defendant in premises
Positive ID of defendant, defendant nearby with stolen property
Positive ID of defendant, defendant nearby without stolen property
    within 1 hour
Person who knew defendant place him/her in/near premises within 1 hour
Car license number linked to defendant

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Defendant's car matched description
Tiremarks, shoeprints, clothing or "other" of defendant matches descrip-
        tion of witness
Photos taken at scene
Burglary tools impounded
Defendant possessed stolen property when arrested near scene within 1
        hour
Defendant possessed stolen property when arrested later than 1 hour
Intent clear, e.g. stashed property
Informant implicated defendant
Co-defendant implicated defendant
Defendant admitted being at scene
Crime discovered in progress by police
Crime discovered in progress by victim/witness
Crime discovered later, after defendant left
Other factors link defendant
Police officer who primarily prepared this report was detective, patrol
        or other
Warrant was obtained by police, victim or other.
Prosecutor's estimate of the amount of harm done

        4. Dependent Variables

        All prosecutors were asked to rate the cases along the dimensions

of quality of case preparation and estimated disposition as originally plan-

ned. For each case they were given a form marked, "CASE PREPARATION EVALUA-

TION FORM," with the following instructions:

> Please assume that the cases had been bound over from General
> Sessions Court and assigned to you for disposition. Review the
> entire file. Then respond to the questions below. Our interest
> is in knowing how well or how poorly this report provides you with
> information needed to make a sound decision about each of the pos-
> sible legal issues below. We are not asking you to evaluate the
> quality of the police investigation itself. Our interest is in
> knowing whether the police have written a report that anticipates
> the information needs of the prosecutor. How fully have they
> reported what they know about the case so that you the prosecutor
> can make an independent judgment about what the appropriate disposi-
> tion should be?

> To what extent does the report provide you with information required
> to reach a sound judgment about each of the following legal/factual
> issues:

>> whether defendant(s) had an intent to commit a felony
>> within the premises (variable = intent)

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whether an actual breaking and entering occurred (variable = break)

whether defendant was unlawfully upon the premises (variable = uprem)

report establishes sufficiency of Miranda warnings (variable = miran)

report establishes the legality of any searches (variable = search)

report establishes eyewitness testimony linking defendant to the crime (variable = witn)

report establishes physical evidence linking defendant to the crime (variable = evid)

Taking into account all the dimensions of a case about which a prosecutor need information in order to decide what the proper disposition should be, how well or poorly has this case report been prepared? (variable = overal)

The above questions were rated on a seven point scale (1 = very

poorly, 7 = very well). Two other questions (below) were rated

on a similar scale.

If you could speak to the police officer who prepared this report, how much additional information or clarification would you seek? (0 = none, 7 = a lot)
(variable = addinfo)

How likely is it that if you got the information... this case would come to a different disposition than it is likely to receive without it? (1 = very unlikely, 7 = very likely) (variable = dif-dispo)

Also, an Osgood Semantic Differential-type scale (Osgood et al.,1957)

was used. Prosecutors were asked to rate the police reports along four

dimensions. The dimensions and their anchor points for ratings of 1 to 6

are as follows: minimal to comprehensive; weak to strong; trivial to serious;

confusing to understandable (variable names, respectively, = comp, weak,

serious, confus). They were also asked the following: to estimate the pro-

bable disposition of the case (variable = dispo); to estimate what the most lenient plea offer the case would get (variable = offer); to estimate the probability (0% to 100%) of conviction (variable = convict); and to give the degree of their confidence (0% to 100%) in their assessment of the probability of conviction (variable = confid).

5. Analysis

The data from the quasi-experiment were analyzed using the general linear model (GLM) procedure for unbalanced analysis of variance (ANOVA). The GLM-ANOVA procedure is recommended over the ANOVA procedure in most unbalanced situations, i.e. where there are unequal numbers of observations for the different combinations of CLASS variables specified in the model statements (SAS Institute, 1985), as was the case with our data.

C. Interviews

Interviews were conducted with prosecutors after they had used the computer-assisted case report and had completed the structured evaluation form. The interviews were semi-structured. Also, the police officers and supervisors who used our computer program or were trained on it or had it demonstrated to them were interviewed. A few who had entered cases using our program also completed an evaluation form that was specifically directed at their opinion of the value of our software[8].

D. Results

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[8]. See Nashville Police Opinion Survey Regarding The Computer-Assisted Burglary Case Preparation Program form in the Appendix.

The presence or absence of the computer-assisted case reports in the
case file had a significant impact on the prosecutors' evaluation of the
quality of the case preparation and the probable case disposition under
certain conditions but not under all conditions.

The presence or absence of the computer enhancement did not have a
significant independent effect on the prosecutors' evaluations; but it did
have significant effects in interaction with two of the three criminal inci-
dent fact-patterns used in the evaluation. These interaction effects were
in opposite directions. In one case the presence of the computer-assisted
report led prosecutors to evaluate the case as being stronger and better
prepared. In the other case it led them to evaluate the case as being weaker
and not as well prepared.

We had expected that the presence of the computer-assisted report would
have a significant independent effect on all cases in the direction of improv-
ing the perceived quality of the preparation and the case strength. However,
we also recognized the theoretical possibility that by improving the clarity
of reports some reports may be discovered to be weaker than they might other-
wise have seemed. In theory, information by itself is neutral. Thus our
mixed results are neither entirely unexpected nor do they represent a negative
finding. They do not mean that the computer-assisted reports make no differ-
ence in the prosecutors' evaluation a case.

1. Main Effects

In 16 of 18 comparisons between the tradition manually produced reports and those supplemented with the special report generated by our software, there were no significant differences. In the two cases where significant differences did occur[9], they were in the "wrong" direction. The reports without the computer-assisted supplements were rated better.

Not surprisingly, the three cases differed significantly among themselves on 9 of the 18 comparisons[10]. As expected, one of the dimensions along which they significantly varied was the prosecutors' estimates of the respective probabilities of conviction. However, the pattern of variability was surprising (see Table 6.1).

Table 6.1

Prosecutors' Estimated Probability of Conviction By Case

Case #	N	Mean	Std Dev	St Err of Mean	Vari- ance	Coef. of Variation
1	17	75.5	19.3	4.8	393.3	26.2
2	17	79.6	21.9	5.3	480.2	27.5
3	17	62.0	31.2	7.5	975.1	50.3

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[9]. How well the report allowed the prosecutor to determine whether a breaking had occurred and how much confidence the prosecutor had in his/her estimate of the probability of conviction.

[10]. Significant differences (at the .05 level) occurred among the three cases for the following variables: uprem; miran; search; witn; evid; overal; serious; addinfo; difdisp.

Case 3 where the defendant was caught by the police exiting a building that he had burglarized and which therefore seemed to be a "deadbang" (high probability of conviction) case, got the lowest average (mean) rating (62.0% on scale of 0%-100%).[11] It was statistically significantly lower than the other two cases.

One of them (Case 2) had seemed to be legally problematic. It relied on a witness who reported that he had not gotten a good view of the defendant and whose description of the defendant (approximately 18-21 years of age) did not fit the person he picked out of a photo line-up (age 35). Yet, Case 2 received the highest mean probability of conviction score of all three cases (79.6% as against 75.6% for Case 1). (Cases 1 and 2 did not differ from each other significantly regarding the estimated probability of conviction.) These findings suggest that prosecutorial estimates of case strength are more problematic than the literature indicates (Jacoby,1980; Mather, 1979; McDonald et al., 1979)[12].

 ᵔ. Interaction Effects

Although the presence or absence of the computer-assisted report did not have a significant "main effect" (i.e., an independent effect), it did have a significant effect when it interacted with the differences among

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[11]. Evidently, there was considerable disagreement among the prosecutors regarding the strength of Case 3. Notice that its coefficient of variability is twice that of the other two cases (55.4 compared to 27.5 and 26.2, see Table 6.1).

[12]. The relevance of this to the present project is that it suggests some of the difficulty to be faced by any future effort to evaluate the quality of case preparation by using prosecutors to rate cases.

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the three cases. In 16 of 18 measures of quality of case preparation or probable case disposition, the interactions between the two variables were significant. See, for example, Table 6.2 which presents the data for the variable, prosecutors' estimates of the probability of conviction.

Table 6.2

Probability of Conviction GLM-ANOVA

Dependent Variable: Probability of Conviction

Source of Variation	DF	SS	MS	F	Significant	Level
Model	5	20892.8	4178.5	16.25	yes	0.0001
Error	45	11571.6	257.1			
Total	50	32464.5				
			R-square = 0.643			

Source						
Case	2	914.1		1.78	no	0.1807
Method of Preparation	1	442.5		1.72	no	0.1962
Interaction: Case* Method	2	17566.7		34.16	yes	0.0001

Ordinarily, if the variable of interest (such as the presence or absence
of the computer-assisted case report) does not have a significant main effect,
then there is little reason to examine any effect it might have in interaction
with another variable. Under any circumstances one must be cautious about
attributing inappropriate meaning to interaction terms.[13]

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[13] Blalock (1979:366) warns against the danger of
attributing substantive meaning to statistical terms like
"interaction terms". With regard to interactions he writes:
"[p]erhaps the most cautious approach is to realize that whenever
one finds statistical interactions of substantial magnitude, this

Nevertheless, in the case of our findings it seems legitimate to call

attention to the fact that in interactions with one other variable, namely,

the case fact-pattern, our variable of interest (the presence or absence of

the computer-assisted case report) was significantly related to 16 of the 18

measures of quality of case preparation and probable disposition. Moreover,

the pattern of the interaction was consistent across the 16 items.

Taken as a whole this tends to support the conclusion that our software

has a significant effect on the prosecutor's estimate of the case and its

probable disposition but only under certain conditions, namely, the conditions

presented by some criminal cases but not by others.

This conclusion can be understood more clearly with a closer look at

the interaction term for one of the items, such as the probability of convic-

tion. As shown in Figure 6.1, the presence of the computer-assisted case

report has virtually no impact on the mean estimated probability of conviction

in Case # 1 (the traffic stop with stolen property found in the trunk) (75.5%

compared to 75.7% for the manually produced reports).

In the other two cases the computer report does have an impact but in

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means that two or more variables have joint effects on some
dependent variable that are too complex to be adequately
described by a simple additive model. The presence of
statistical interaction therefore constitutes a clue that
relationships are more complex than might have been thought, but
by itself interaction should not be treated as though it were
something apart from the "main" effects of the variables under
consideration."

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Figure 6.1

Probability of Conviction
By Case & Method of Preparation
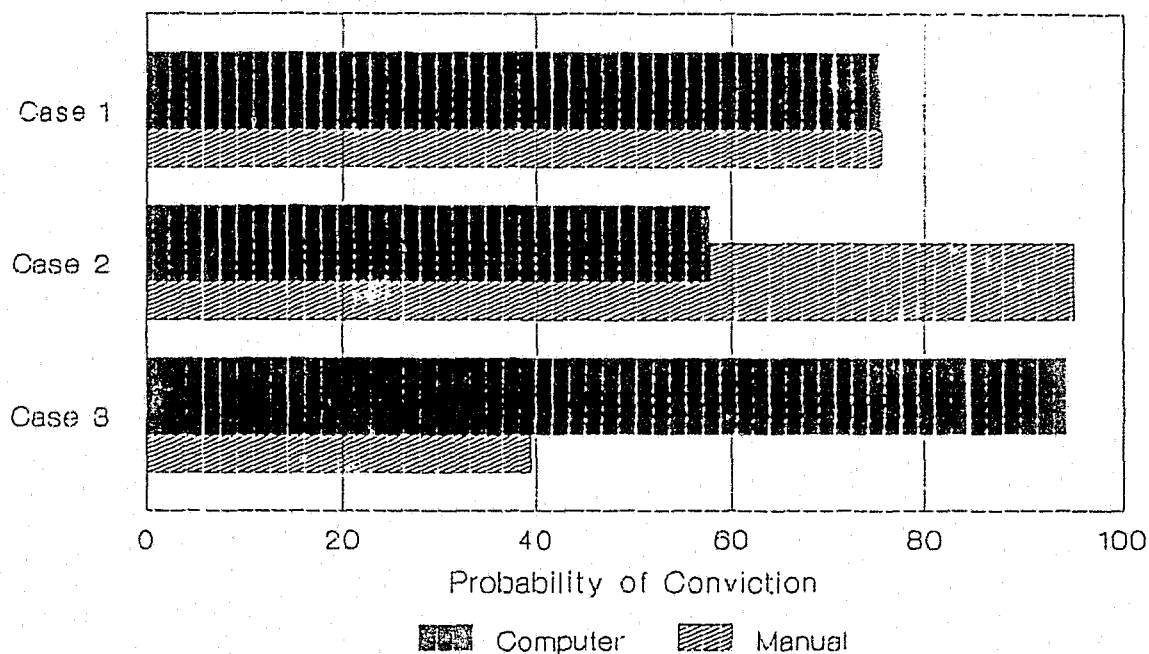
each case it is in the opposite direction. Thus the two cases cancel each other out and thereby suppress the impact of the experimental variable (i.e., the presence or absence of the computer-assisted case report).

In Case # 2 (where the victim picks a defendant out of a photo-array although he does not match the victim's admittedly uncertain description of him), the presence of the computer report is associated with a much lower estimate of the probability of conviction (57.8% compared to 94.9%). By contrast, in Case # 3 (where the defendant is caught coming out of the build-

ing he burglarized) the computer report greatly increased the estimated

probability of conviction (94.2% compared to 39.5%)

In other words, Case # 2 which on the face of it seemed legally problem-
atic was more likely to be seen as problematic by prosecutors who got the
computer enhancement than by those who did not; and, Case # 3 which seemed
to us to be a dead-bang case was more likely to be seen that way by prosecu-
tors who got the file with the computer enhancement than those who did not.
In short, this suggests that the computer program did what one would hope it
would do, namely, make a weak case appear weak and a strong case appear
strong. Remember that information is neutral. More information in a case
report will sometimes mean that cases that would otherwise have appeared
strong will now appear weaker and vice versa.

This same general pattern of the computer report having an opposite
impact in Cases 2 and 3, and no impact in Case 1 also occurs in 15 of the 18
items. Moreover, the impact is always in the same "direction", i.e., the
computer-assisted report makes the item being rated score "worse" in Case #
2 and "better" in Case # 3.

For example, prosecutors were asked to take all dimensions of the case
into account and then state how well the case report supplied them with the
information needed to decide what the proper disposition should be. The
case files containing the computer-assisted reports were rated substantially
lower (than the files with just the manual reports) for Case # 2; but were
rated substantially higher for Case # 3 (see Figure 6.2).

Similarly, when prosecutors were asked how much more information they would want to know about the case if they had a chance to talk to the reporting officer, the file with the computer enhancement were rated as needing a lot more information than the manual file for Case # 2; but the reverse was true for Case # 3 (see Figure 6.3).

In contrast, when prosecutors were asked about the likelihood that the case would reach a different disposition (than the one they had predicted) if they could talk to the reporting officer, the cases with the computer enhancement were rated more likely to reach a different disposition for Case # 2; and less likely for Case # 3 (see Figure 6.4).

In summary, for Case # 2 compared to those who received the traditional manual file, the prosecutors who got the file containing the computer-assisted report were more likely to say that the quality of the information in the case report was insufficient; that if they had a chance to speak to the reporting officer they would seek a lot of additional information; and that it was very likely that information could lead to a different disposition. The pattern was reversed for Case # 3.
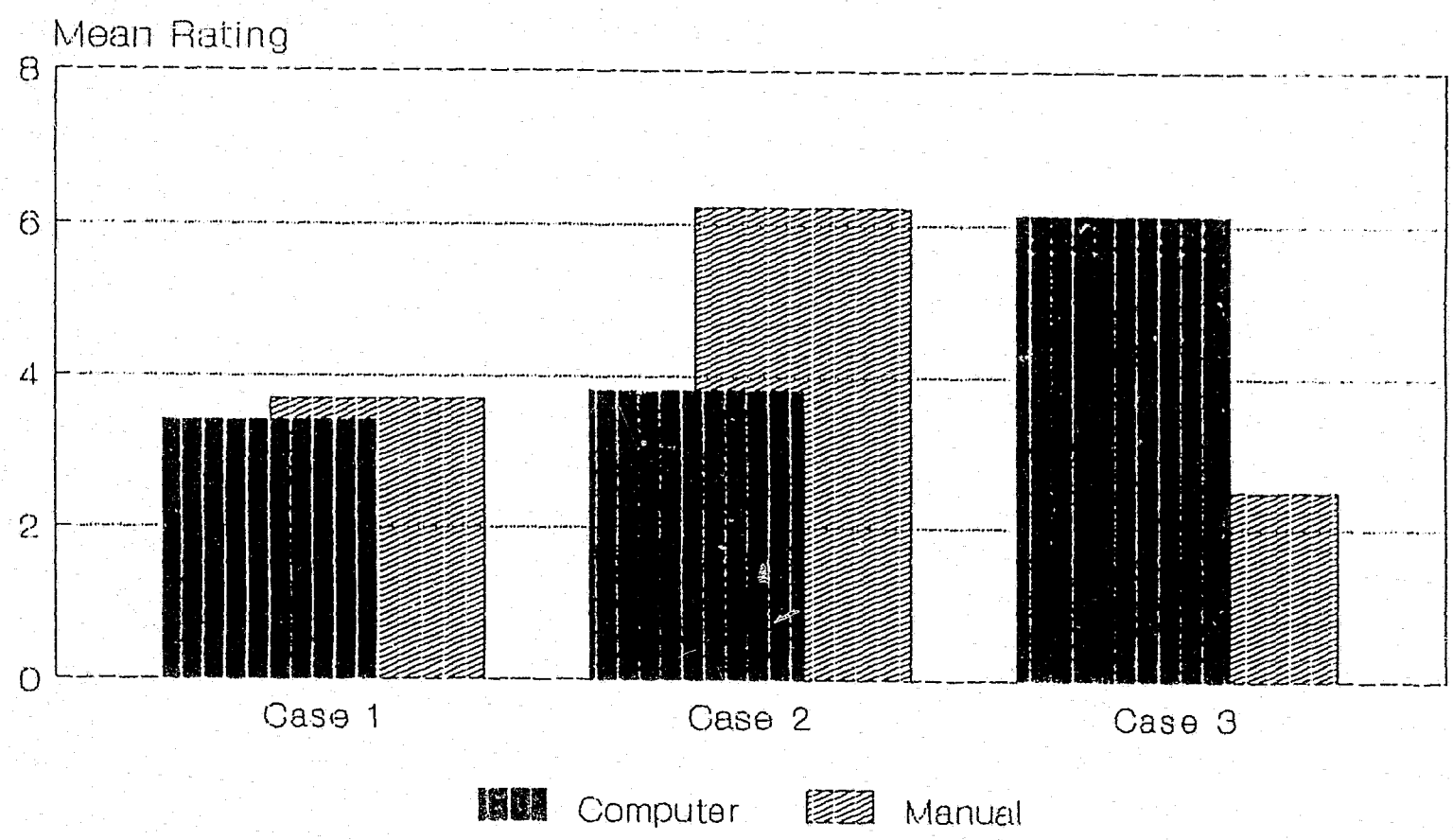
3. Prosecutor Interviews

The response among prosecutors to the sample case reports produced with the assistance of our software was strongly positive but with important qualifications.

Figure 6.2
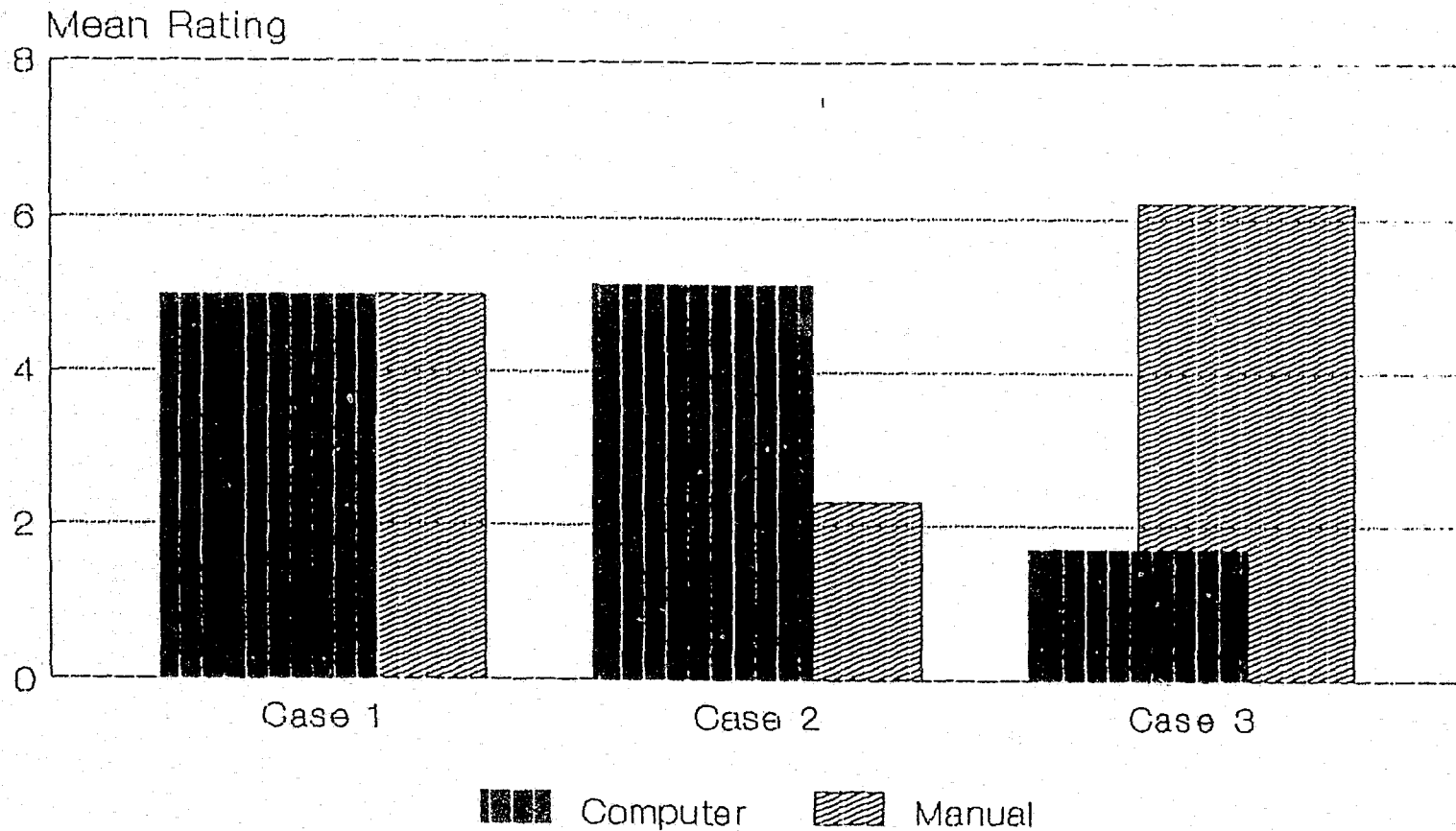## Overall Evaluation of Case Reporting by Case & Method of Preparation

Mean Rating

Computer   Manual

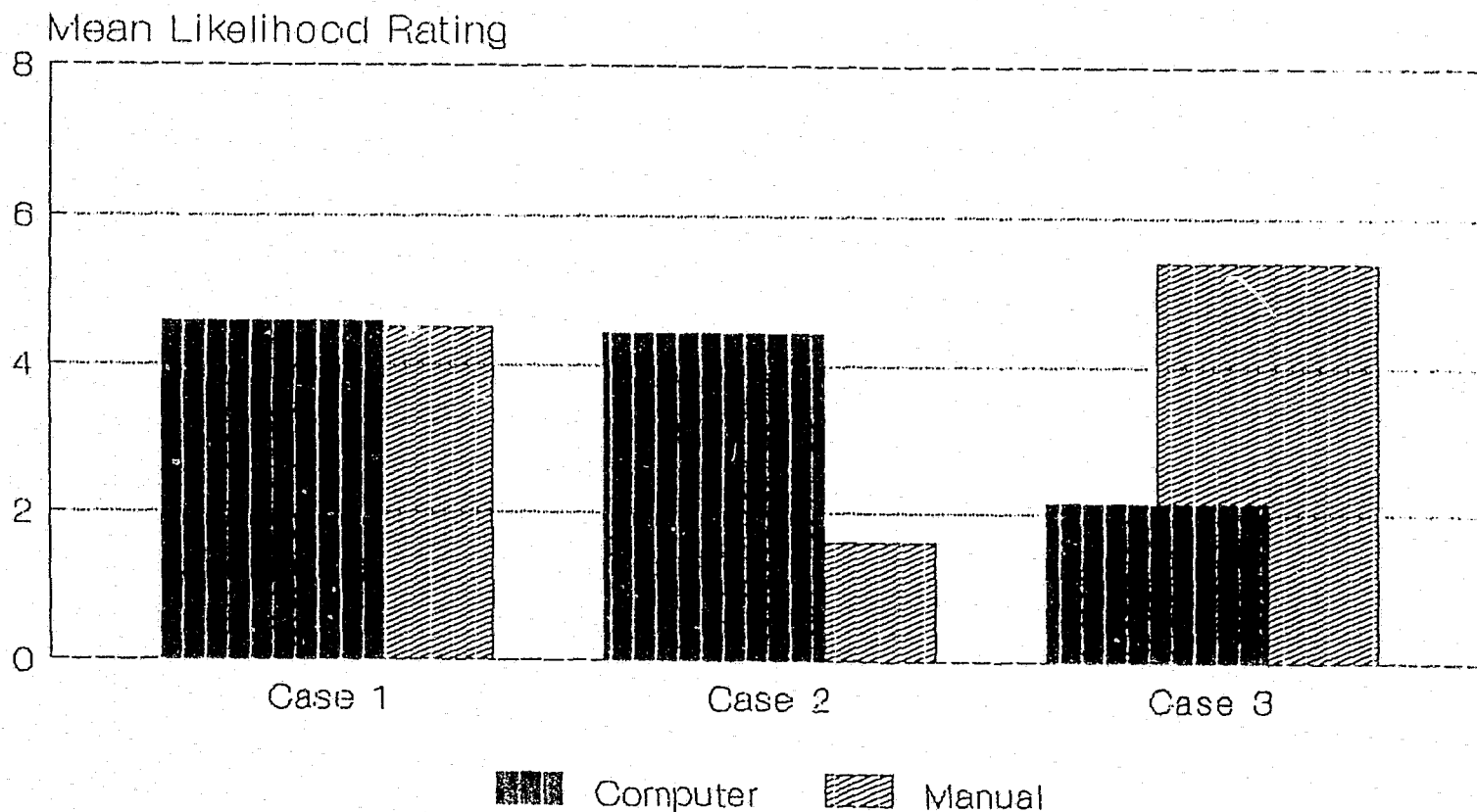Means, on 7 point scale, 7 = very well.

Figure 6.3
Amount of Additional Information Needed
By Case & Method of Preparation

Means, on 8-point scale, 8 = a lot.

Figure 6.4 Likelihood of Different Disposition Upon Additional Information By Case and Method of Preparation

Mean Likelihood Rating

Computer   Manual

Means, on 7-point scale, 7 = very likely
1 = very unlikely.

With absolutely no training in the use of our reports, prosecutors were
able to read them and understand them immediately. They liked numerous
particular features of the computer-assisted case report including its legi-
bility; its level of detail; its consistency (among different authors of
reports); its summary of the roles enacted by everyone in the case; its
format; and its comprehensiveness.

The prosecutors said that the computer-assisted reports made it easier
for them to quickly review the highlights of the case, an important advantage
when one has to dispose of a large daily caseload without much time for
thorough preparation.

But, prosecutors also pointed out some limitations of the computer-
assisted reports. The most critical limitation is that the program can not
eliminate the need for a free-form, narrative section to the police report.
It is to the narrative that the prosecutors ultimately go in order to deter-
mine how all the parts of the puzzle fit together.

Only by reading the narrative of the incident as a whole can one answer
(or, at least draw inferences about) certain questions which can not be
reliably answered with short-answer-type items. For example, our software
asks the officer to state the legal grounds for any searches. It then prompts
him/her with a menu of answers to select from (such as "probable cause").
But prosecutors were suspicious of those answers and had to read the narrative
to try to guess what really happened. They doubted that computerization

could ever solve the problem of the officer whose reports can not be trusted no matter how they are produced.

Prosecutors had other concerns about the computer-assisted report. One speculated that computerizing the police reporting process could actually have the opposite effect than the one intended. If the computer replaced the manually-produced report, it might weaken the prosecutor's case. There might be typographical errors (for example, on dates or numbers) which could not be as easily corrected; police memories about the cases may not be as vivid if they did not have their own handwritten reports to review; more information might be left of the computer-assisted version than the hand-written version.

Although our quasi-experimental analysis indicates that the presence of the computer-assisted case report made a difference in the prosecutors' estimates of the case in two out of three of the fact-patterns, the prose-cutors themselves were unable to predict this finding. They were unsure whether having the computer reports had influenced their decision-making. But most of them indicated that even if the computer-assisted report did not make a difference in the case disposition, they would prefer to have the computerized reports.

4. Police Interviews

Although the police made very little use of our software, it was not because they were opposed to the idea behind it. Indeed virtually all detectives familiar with our software were in favor of the idea behind it;

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hoped that further work would be done to develop it; and indicated that they would prefer to use such a program rather than write reports manually (assuming the software met certain conditions discussed below).

They felt that if prosecutors had to choose between manually produced reports and ones produced with the assistance of a software application such as ours, the prosecutors would prefer the computer-assisted reports because of their greater legibility, clearer organization and because the computer method seemed to help the police include more information relevant to proving the case.[14]

Moreover, even though they found it slow and difficult to use our software, they believed that with practice they would be able to produce reports as fast as by hand.

On the other hand, when asked to compare the value of the reports produced with our software to the special prosecution reports produced by Nashville Police Department's Case Preparation Unit, most of the detectives believed that prosecutors would find the latter more useful.

There are four conditions that the detectives regarded as essential before they would use such software: (1) the software must be highly user-

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[14]. One dissenting view was expressed by a detective who is notorious among prosecutors for filing poor case reports. He believed that prosecutors would prefer manually produced reports because in court handwritten reports might "seem more affective rather than 'just a computer number'".

friendly; (2) the police would have to be adequately trained on it; (3) the report that they would type on the computer must not duplicate any other report that they would have to give; and, (4) hard-copies of the reports must be readily available if wanted. (None of these conditions were met by our program.)

5. An Alternative Model: ALECS

Although our particular software design proved too cumbersome for the police to use, we have reviewed an alternative design that holds promise. It is one that we considered and rejected because it is more modest than what our project attempted. Nevertheless, its comparative simplicity seems to be the key to its success.

The design is the one that underlies the proprietary program called ALECS by Coastal Computer Systems. It is currently fully operational and being used by two police departments who give it high praise.[15]

This software does not attempt to simulate an interview with a prosecutor (as ours does) and it does not assume that police officers can not type (as ours does). Officers sit at a terminal and are prompted to fill in the

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[15]. The system was produced by Coastal Computer Systems, Inc., Long Beach, New York. Its development was initiated by Lt. Joseph Lauriano of the Lynbrook (New York) Police Department. It operates on a minicomputer and can be configured to support as many as 150 terminals at one time. It does on-line booking and arrest processing and preparation of the prosecution report. It also performs other functions.

items on the screen which is just an electronic version of the usual police
report form. At the end the police-user types in a narrative account of the
event as one would do on existing police forms.

Also being prepared for optional use with ALECS is an expert system
that selects charges based on a few questions that the computer asks the
officer. The limited prototype model of this expert system that we reviewed
demonstrates the technical feasibility of using an expert system to assist
in making this limited decision. But the desirability of the use of an
expert system for this purpose is far more problematic than the use of the
rest of the system.

The ALECS system has not been evaluated systematically. It is not
known whether it has altered the pattern of case attrition in the local
jurisdiction. The expert system component has not even been field tested
yet. What is known is that the police in those cities have not had any
problem learning to type and enter their cases on a computer terminal and
that they are quite pleased with the system.

6. Expert Systems

What can be anticipated is that the use of an expert system to
select charges in cases will sharply highlight the normative and political
problems surrounding the question of "proper charging". The prototype model
that we reviewed is based on a literal reading of the penal code. It selects
all charges that are legally relevant given the facts of the case.

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It produces what some standard-setting professional groups would call "overcharging". The system could be programmed to be more restrictive in its charge selection but doing so would require that the local prosecutor take the political risk of clearly specifying the criteria for not accepting or downgrading charges in certain types of cases.

When we suggested to the police executives in the departments that were using ALECS that the expert system could be added and used to screen out cases they were strongly opposed to that use of such a system. On the other hand, they were all in favor of using the system to locate every and all relevant charges in a case.

IV. Conclusions

The results of this project can only be described as mixed. The conclusions to be drawn must be regarded as tentative and in need of additional confirmation. We may be overgeneralizing somewhat from our limited experience. Nevertheless, we believe that it is a reasonable working hypothesis to conclude that it is feasible to have police produce their case reports by interacting with a computer and that such reports will affect the pattern of case disposition. However, there is a crucial limit to the way in which software can improve the quality of police reports.

Small-computer-based interactive software can improve the legibility, reproducibility, organization and quick-readability of police reports. It can also increase to limited extent the particular items of information asked in a typical report. But it can not eliminate the need for the police to be able to use a keyboard with reasonable efficiency. It can not produce a narrative account of the criminal event; nor can it begin to approximate the kind of interactive supervision of the giving of a narrative as occurs in case preparation units where prosecution-knowledgeable supervisors guide officers through a dictated narrative report.

There are two sections to police reports. One consists of discreet, short-answer items of information (such as the name, address, age etc. of the defendant). The other is the free-style narrative which gives a chronological account of the incident.

It is possible to create software that simulates the kind of interaction that occurs between a police officer and a prosecutor during a case screening session. The computer can be programmed to ask branching questions contingent upon answers to earlier questions. This capacity can be used to either create an electronic version of existing police report forms or to go beyond that and ask additional questions. However, the number of additional questions must be kept to a minimum to avoid oppressing the user.

The problem is that while the computer is excellent at analyzing a case into discreet, short-answer-type questions, it can not synthesize that

information into a coherent narrative account of the case. For the foreseeable future the narrative must be given free-style.

The microcomputer can not simulate the kind of guided narrative-giving done by case preparation units where the reporting officer dictates his/her report under the direction of a person experienced in the information needs of the prosecutor. The main advantage of using the computer as a way of increasing the amount of information in a case report lies in increasing the information in the short-answer section of the reports.

Prosecutors use both sections of police reports but in different ways. They tend to go to the narrative first and may rely upon it entirely in some cases. The short-answer section is used either for specific details (telephone number of a witness) or to make inferences about the accuracy and veracity of the narrative. The latter is always a selective telling of the events that represents the police officer's reconstruction of the social reality of the incident. The short-answer section is used by prosecutors to try to decide how much of that reconstruction is to be taken at face value. For instance, items such as dates or times or place of arrest that are listed in the short-answer section can raise doubts or help make inferences about parts of the story covered in or omitted from the narrative.

Some aspects of the case that are of crucial importance to the prosecutor (such as the legality of the arrest and search) can not usefully be reduced to a short-answer, yes-or-no-type questions. Such matters call for professional judgments. Prosecutors would not accept the judgments of the police

officer(s) involved. They would want to make their independent judgments
and to do so they would consult the narrative.

Thus the marginal increment in the amount of information obtained from
the police by use of an interactive software application is limited mostly
to the additional questions that can be added to the short-answer section of
police reports. This can not be too extensive without discouraging users
and possibly defeating the program.

On the other hand, our field evaluation suggests that even if a software
application did not add more information to the fund of information in re-
ports, if it merely resulted in a clearer, cleaner, better-organized, more
legible report than the traditional manual report, it could have an impact
on the dispositions of cases. At a minimum, prosecutors would welcome the
improvement in this dimension of the quality of the documents which are the
main basis for their decision-making. They even believe that it would make
them somewhat more efficient.

Police officers are not only willing to use interactive computer programs
to type their own reports, they favor the idea and are able to develop some
facility at using the keyboard even without special training. However,
there are at least four conditions that such software should meet. It should
be user-friendly. Some training on the use of the computer should be given.
The reports typed on the computer should not duplicate reports that must be
given by hand. Hard copies of the report should be readily available if the
officer needs a copy.

With regard to user-friendliness, it is possible to have too much of a good thing. A fatal mistake in the development of our software was in trying to give the police-user too much help. It was wrong to assume that law enforcement software applications must minimize the amount of typing to be done by the police. Special features such as "pop-up" screens, which were intended to reduce the officer's typing load by allowing many questions to be answered by selecting choices from lists, created typing loads of their own. In the end they were unnecessary and self-defeating. The police are able to do an adequate job of typing when left on their own; and, more importantly, it is apparent to us now that typing skills should be among the requirements of today's professional policing.

The use of the computer for "artificial intelligence" or "expert systems" applications was not directly tested by the present project. However, our experience and our review of a prototype expert system that selects police charges in criminal cases suggest some tentative conclusions about this growing area of interest in law enforcement.

Computer-based decision-guiding systems are more likely to succeed as useful tools for law enforcement if they are operated as part of a larger system where police officers are already experienced with using a computer keyboard; where the number of questions asked by the expert system and the number of files it requires the user to consult does not exceed the user's estimate of the value of the program; and where there is ready and convenient access to the computer. Expert system applications to some topics,

such as the selection of charges, have the potential for creating severe
controversies and political risks for the parties involved either because
implicit policies are made explicit or because existing policies may be
changed.

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