ROBBERY DETERRENCE:
AN APPLIED BEHAVIORAL SCIENCE DEMONSTRATION

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FINAL REPORT

WESTERN BEHAVIORAL SCIENCES INSTITUTE
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ABSTRACT

A field experiment, carried out by Western Behavioral Sciences Institute, tested robbery deterrence techniques based on the perspective of former armed robbers. Through the cooperation of Southland Corporation, 120 twenty-four hour convenience stores in five Southern California counties were used in the research. Techniques, including physical changes and employee training, were implemented in 60 experimental stores. These stores were closely matched, on a stratified random basis, with 60 control stores. The robbery experience of both groups was followed for eight months.

The control stores experienced 59% of the 97 robberies which occurred, whereas the experimental stores experienced 41%—a significant decrease. Stores with frequent previous robberies and rated as attractive to robbers benefitted most. A small percentage of stores had most of the robberies, and this pattern was consistent for 1973, 1974, and 1975. The results support the concept that robbers select their targets and that physical and behavioral changes at the site can significantly reduce robberies.

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PREFACE

The purpose of the research was to study armed robbery in small businesses by testing out deterrence methods through a classic experimental design in a field setting. The basic strategy has potential application to all armed robberies and emphasizes prevention.

Many of the ideas behind the study were generated during conversations with Ray Johnson who has described his "credentials" in his recent book, Too Dangerous To Be At Large, Quadrangle Press, 1975 (Mona McCormick, Editor).

The cooperation of Southland Corporation and its employees, throughout the course of this study, was greatly appreciated. Richard Dole, Vice President, gave his support very early and throughout, and Seth Burgess, Loss Prevention Manager, shared his extensive data bank and was invaluable for his wisdom and experience. The security personnel, such as Jerry Lowery, of the Western Division; zone and district managers; store owners, managers and clerks in Southern California cooperated with our staff, providing information and participating in the demonstration.

The team members who made over one thousand visits to stores and trained employees were Ronald K. Birkelbach, James L. Bull, Raymond D. Johnson, Robert O'Leary, and Ralph C. Mendoza. Mona McCormick wrote Robbery Prevention: What the Literature Reveals, which is a separately published part of this study. Theodore Melnechuk devised the video-tape

training procedures; Rosemary J. Erickson coordinated the data collection and analysis, and working with her were Gerri Jordan and Marian Ashton. The data analysis was carried out by Gary Shope and Deborah D. Mullen. Appreciation and thanks are extended to the secretarial staff, particularly Betty Greene, and other members of the staff, including Patricia Falck, Chester Niebrugge and Peter Shoup, who contributed in numerous ways to the study.

Our consultants who advised on study design were J. Edward Russo, Raymond D. Jessen, Floyd Feeney, and Richard Post.

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SUMMARY

The purpose of the study was to design robbery deterrence techniques for implementation in small convenience stores and to evaluate the impact of the measures in decreasing robberies and reducing financial losses.

The study was distinctive in a number of ways. First it was an example of private initiative in combatting crime. A private non-profit research institute (Western Behavioral Sciences Institute) and a large private company (Southland Corporation) joined together, and with NILECJ funding, performed the study. Second, the study relied heavily on the insights of ex-armed robbers who were staff members. Third, the study methodology was one rarely used—classic experimental design in a field setting. Most importantly, a new and relatively unexplored alternative strategy for reducing armed robbery was for the first time subjected to scientific analysis.

As distinct from the prevailing law enforcement approach, to apprehend and punish robbers, the present approach emphasized prevention, to alter conditions at the scene of the crime so that the robber would not attempt the robbery.

The study tested the approach by gathering evidence to support or refute each link in the following argument:

— If robbers exercise selection among targets, then robberies will not be distributed at random across similar stores—some stores will be robbed more frequently and some less frequently than others.

— There must be differences between frequently robbed and infrequently robbed stores that can be identified and reliably measured.

— The characteristics which differentiate frequently robbed stores must be physical and behavioral factors specific to the site and not general features such as the socioeconomic level of the store's surroundings.

— It must be possible to change the significant characteristics through training or physical alterations that are feasible within reasonable costs and business requirements.

— The reduction in robbery due to the training and physical changes must add to personal safety and cut losses enough to be worth the effort to implement them.

— In order to warrant widespread adoption, the effects of the robbery prevention procedures should be long-range or semi-permanent and therefore cannot depend on secrecy or deception or be easily circumvented.

Frequency, Cost and Occurrence of Robbery

Analysis of the data from robbery reports indicated the following:

-Robbery is increasing more frequently than other serious crime.

-Robbery is the primary source of violence from strangers.

-The expected frequency of robbery for convenience stores exceeds one robbery per store per year.

-The expected frequency of death for any particular store is once every 256 years.

-The dollars lost from robbery is a negligible expense of doing business.

-Robberies occur more frequently during the late fall.

-Robbery is not a weekend crime but occurs every day of the week.

-Robbery is a nighttime crime—it occurs five times more often at night than during daylight hours.

-Robbers probably wait inside or outside the store for customers to leave.

The Experience of the Robbery Victim

The robberies usually occur at night, so the victim is working alone in the store, cleaning up or stocking shelves, and waiting on the occasional customers. About one-third of the time the robber posed as a customer first and then announced the robbery. In over 80% of the cases a weapon was shown; and in all cases, it was claimed. The robbery incident was usually very short, with very little verbal communication. Fortunately, in only 17% of the cases was violence committed. One-fourth of the clerks had weapons in the store, but they were hardly ever used, and nearly always, the victim was cooperative. Usually there were some aftereffects for the victim, which appeared most often as a lack of trust in people. One-third of the employees quit after being robbed, one-half of them said it was because of the robbery.

Characteristics of Robbers and Their Perspective

The convenience store robbers act alone in three out of five robberies. They are usually young males of all races, and they nearly always carry a

handgun. Even though the victims are more likely to think the robber is an amateur than a professional, they also feel the robbers are calm, or "cool." In only 8% of the cases was the robber apparently high on drugs or alcohol. Most often the robber had the victim handle the money—open the register and put it in a bag. The robbers in these stores did not take particular steps to prevent pursuit.

The perspective of the robber, as seen through the eyes of reformed ex-robbers on WBSI's staff, was used in designing robbery prevention methods. The concepts were organized into a model which relates the robber's initial motivation to commit robbery, his image of target suitability and the projection of site characteristics. It is the interrelation of these three concepts which give rise to the behavioral processes of robbery. Characteristics of stores were organized into a model linking the robber's image of suitability and the projection of the site's features.

The Differences Between Frequently and Infrequently Robbed Stores

Analysis of data on robbery frequency yielded the following results:

- Only 27% of the stores accounted for 72% of the robberies.
- The frequency with which stores were robbed was consistent from year to year.
- More stores had zero robberies and more stores had frequent robberies than would be expected by chance.
- The socioeconomic status of a store's neighborhood was not related to robbery frequency.

- The sales volume of a store was not related to robbery frequency.
- The attractiveness of a store to robbers can be reliably measured.
- The more attractive a store is to robbers, the more frequently it was robbed.

Procedures for Preventing Robberies and Avoiding Violence

The techniques used to prevent robbery included the strategic placement of new signs announcing a low amount of cash-on-hand in the store; physical changes such as moving cash drop boxes to make them more conspicuous and improving lighting in the parking lot; and training of the store owners, managers, and clerks in a series of robbery prevention procedures and violence prevention techniques. The robbery prevention techniques included:

-keeping the store clean

-making the robber visible

-keeping a sharp look-out

-greeting each person who comes in

-keeping as little money in the cash register as possible and making that known

-taking steps to make the store less attractive to a robber, especially late at night

In the event that a robbery should occur, the employees were told to:

-keep the robbery short and smooth

-obey the commands

-not argue

-not fight

-not use weapons

-warn the robber about anything unexpected

-offer to lie down

-not chase or follow him

-call police and store owner

-not tell amount of money lost

The Effectiveness of Robbery Prevention Procedures

A formal experimental design was used in order to test the effectiveness of the robbery prevention procedures. Two groups of stores were selected to be representative of other stores and to be as much alike as possible. The two groups were then assigned at random, either to receive the treatment of the robbery prevention procedures in the experimental group, or not to receive any treatment in the control group. In this way, any differences in their robbery experience subsequent to the treatment would be due to the effects of the experimental procedures. To prevent the experiment from being biased if more of one kind of store than another should end up in either the experimental or control group, the stores were stratified on previous robbery frequency.

The sample was also stratified for attractiveness to robbers. A safety score was computed using the rating on overall attractiveness and selected subscales. Using this score, the entire sample was divided into equal groups, rated from one to four, with four being high safety or unattractive to robbers.

The design thus had twelve cells. Since five experimental and five control stores were desired for each cell (for a total of 120 stores), there were extra stores for most cells. They were kept in reserve in the event that a store had to be eliminated for any reason.

Within each cell, the stores were divided into two matched groups by attempting to make them equal on as many different characteristics as possible. Following this procedure, the stores were divided into two groups of sixty (Groups A and B). Mr. Seth Burgess of the Southland Corporation flipped a coin, and by this random process, Group B was selected to be the experimental group. The adequacy of the design was then tested. There were no significant differences on any of the thirty-five characteristics tested. The similarity was almost perfect—nothing more could be asked from any stratification and matching procedure in an experimental design.

The Robbery Prevention Procedures Were Implemented in the Experimental Stores

In all, 669 people worked in the 72 experimental and reserve stores during the eight-month test period. Of these, 527 or 79% were trained, an average of 7.3 per store. The stores experienced an 80% turnover rate of

employees. Only a few physical changes were made. The four new types of signs were installed in all of the experimental stores, and windows were cleared of advertising signs.

The Prevention Procedures Reduced Robberies

There were significantly fewer robberies in the experimental stores than in the control stores. During the experimental period, January 1 to August 31, 1975, there were a total of 97 robberies for both groups of stores. The control stores experienced 57 robberies, the experimental stores, 40.

The assumptions for analysis of variance were not met by the data so the binomial distribution was used to calculate the probability of the observed distribution of robberies between the experimental and control groups. The difference was statistically significant ($p < .02$).

The percentage decrease due to the prevention procedures can be calculated in two different ways. First, on the assumption that the occurrence of robbery in the control group would be the natural expectation for the experimental group if the prevention procedures had not reduced them, then the percentage reduction is 17 out of 57 robberies, or 30%. On the other hand, 58.7% of the 97 robberies occurred in the control stores, while 41.2% occurred in the experimental stores for a difference or reduction of 17.5%.

It was also expected that the robbery prevention procedures would reduce the average dollar loss per robbery because reduction of cash in the

register was stressed during the training. However, no effect was found, as there were only chance differences between the losses for the experimental and control stores.

No evaluation of the effects of the violence prevention procedures was possible. Very early in the study, it was realized that violence would occur so seldom that any analysis would be invalid unless many more stores were involved.

The robbery prevention procedures reduced robberies. However, they were not effective for stores that previously had not been robbed frequently, nor for stores that were already unattractive to robbers. They were effective for stores that were frequently robbed in the past and for those stores which were attractive as robbery targets and consequently could be helped most by the prevention procedures.

It can be concluded that the evidence supports each link in the chain of argument. The results taken together indicate that a promising new alternative strategy for reducing armed robbery has been established. This strategy is a potentially effective means to significantly reduce crime.

At their present stage of development, the prevention procedures were effective only with stores that had previously been robbed frequently and were attractive to robbers. Further development of the techniques appears possible and is needed before they can be widely applied on a practical basis. It is essential to reduce the costs of their implementation and to fill gaps in knowledge. In particular, the effect of reduced cash on robbery frequency is not known and should be vigorously tested.

CHAPTER I. INTRODUCTION

This is a report of a study of armed robbery in small businesses. The study was distinctive in a number of ways. First, it was an example of private sector initiative in combating crime. A non-profit research organization (Western Behavioral Sciences Institute) and a large private business concern (Southland Corporation) teamed up and, with government funding (National Institute of Law Enforcement and Criminal Justice), accomplished what none of them could have done alone. Second, the study relied heavily on the insights of ex-armed robbers who were staff members. Their perspective was joined with that of police robbery experts, private security officials, store managers, and behavioral scientists. Third, the study methodology was one rarely applied in criminal justice research—classic experimental design in a field setting. And last, but perhaps most important, a new and relatively unexplored alternative strategy for reducing armed robbery was for the first time subjected to rigorous scientific analysis.

In the course of the conduct of the study, a wide variety of information was gathered about robbery, much of it not previously available. This information should be useful to small businesses, private security officials, and law enforcement agencies, particularly crime prevention units. The study focused on small food stores open 24 hours a day and therefore convenient not only for customers but also for robbers. These stores share many common characteristics with all small retail businesses and many of the findings of

this study may apply to all stores. However, the extent to which they apply could not be determined in the present study. The results are most directly applicable to the 25,000 convenience food stores in the United States but even there care should be exercised to take into account differences in operating conditions from the stores which were studied. From a strictly scientific viewpoint the results can be generalized only to the 349 7-Eleven stores in 5 counties of Southern California. However, the basic strategy has potential application to all armed robberies even if specific details do not apply.

Most previous approaches to decreasing armed robbery have emphasized law enforcement—to apprehend and punish robbers so that they, and by the example, others, would be deterred. The present approach emphasized prevention—to alter conditions at the scene of the crime so that the robber would not make the attempt. This approach has long been known to store owners, private security personnel, and police officials but their insights and experience have not been systematically gathered or tested by scientific standards. If this approach proved to be successful, it would add to existing crime reduction strategies.

In brief, the strategy assumes that robbers are selective in choosing their targets. If the factors which influence the robber's choice could be identified, then changes could be made in the physical features of the store or in the behavior of store personnel to make it a less attractive target. The alertness of the clerk to activities outside the store, the lighting, the position of the cash register, the visibility through store windows, and money handling practices are examples of the many physical and behavioral features that were studied.

The study tested the approach by gathering evidence to support or refute each link in the following argument:

- If robbers exercise selection among targets, then robberies will not be distributed at random across similar stores—some stores will be robbed more frequently and some less frequently than others.
- There must be differences between frequently robbed and infrequently robbed stores that can be identified and reliably measured.
- The characteristics which differentiate frequently robbed stores must be physical and behavioral factors specific to the site and not general features such as the socioeconomic level of the store's surroundings.
- It must be possible to change the significant characteristics through training or physical alterations that are feasible within reasonable costs and business requirements.
- The reduction in robbery due to the training and physical changes must add to personal safety and cut losses enough to be worth the effort to implement them.
- In order to warrant widespread adoption, the effects of the robbery prevention procedures should be long-range or semi-permanent and therefore cannot depend on secrecy or deception or be easily circumvented.

The present report presents the results of an investigation of the above questions.

The Southland Corporation, which franchises or owns over 5,000 stores, maintains excellent records of their robbery experience. An analysis of these

records provided baseline data which describe the nature of the robbery event. The frequency, time of year and time of day, the cost of robbery, etc., have been analyzed and presented below as CHAPTER II. FREQUENCY AND COST OF ROBBERY AND OCCURENCE IN TIME. The data were examined with the aim of detecting patterns which have implications for prevention strategies.

Robbery is next examined from the point of view of the victim. Interviews were conducted in the study stores with the victims of all robberies which occurred during the months of March, April, June, and July of 1975. A total of 51 interviews was conducted, most of them within one week following the event. The results were analyzed and are presented in CHAPTER III. THE EXPERIENCE OF THE ROBBERY VICTIM. Again, the aim was to detect patterns in the robber's modus operandi that could guide prevention.

Three behavioral scientists who were formerly armed robbers were part of the research team. Through frequent conversations and from meetings and interviews with other armed robbers, police robbery specialists, industry security personnel, and store owners and clerks, insights about the robber's perspective were gathered. Additional information about the sex, age, race, type of weapon used, etc., was analyzed from robbery reports. These results were then organized into a theoretical framework to provide a guide to robbery prevention techniques. It is presented in CHAPTER IV. CHARACTERISTICS OF ROBBERS AND THEIR PERSPECTIVE.

Data from the Southland Corporation on the robbery experience in their Western Division which franchises stores in five Southern California counties were analyzed to determine whether or not some stores are robbed more fre-

quently than others. Then using the results from the previous analyses, a set of measures was devised in order to determine how frequently-robbed stores differed from infrequently-robbed stores. A set of rating scales, physical measures, and an employee interview were designed. A sample of 159 stores was visited and the measurements taken. The surrounding area of a store was examined and positions a robber would use for surveillance of the store were designated, likely parking places for an escape vehicle were located, and escape routes from the vicinity were diagrammed. The store's internal floor-plan was sketched, the place in the store where the robber would most likely position himself was located, entry and exit routes were noted, the amount of lighting was measured, the amount of money in the cash register was counted, etc. This is only a sample of the kind of information that was gathered to determine how frequently robbed stores differed from infrequently robbed stores. In effect, the ex-robber-behavioral scientist teams "cased" the stores for their attractiveness as a target. These data were analyzed and the results are presented in CHAPTER V. THE DIFFERENCE BETWEEN FREQUENTLY AND INFREQUENTLY ROBBED STORES.

Guided by these results, a set of procedures to change store characteristics in order to make them less attractive as robbery targets was devised. These procedures took the form of physical changes, e.g., moving the position of the cash register, etc., and training materials for store employees, e.g., money handling practices, etc. Because of the concern for personal safety, training materials were developed, designed for avoiding violence. Description of these techniques is presented in CHAPTER VI. PROCEDURES FOR PREVENTING ROBBERIES AND AVOIDING VIOLENCE.

The effectiveness of these prevention procedures was then tested using classic experimental design in a field setting. A stratified and matched sample of stores was selected and assigned at random to an experimental and control group with 60 stores in each. In the experimental stores, physical changes were made and store personnel trained in robbery prevention procedures —no changes were made in the control stores. Training was given to 527 employees and owners, and 1,075 store visits were made to implement the study in an area of 5,000 square miles—mostly at night. The robbery experience during an eight-month period was then followed to determine the effect of the prevention procedure. The results of this experiment are presented in CHAPTER VII. THE EFFECTIVENESS OF ROBBERY PREVENTION PROCEDURES.

The report concludes with CHAPTER VIII. CONCLUSION, which includes a discussion of the implications of the results for the prevention of robbery.

In the text the following sources of data are referred to:

1. National Southland—these data are from the Southland Corporation for over 5,000 stores throughout the United States.

2. Western Division—these data are from the Southland Corporation's Western Division which includes Southern California, Arizona, and Nevada (N=547).

3. Population—all stores in the Western Division in operation on January 1, 1974, but excluding Arizona, Nevada, and a few outlying stores. The population included almost all stores in Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties (N=349).

4. Sample—a representative random sample of stores selected from the population (N=159).

5. Experimental-Control—a stratified and matched random sample divided into two groups of 60 each and assigned at random to the experimental and control conditions (N=120).

6. Robbery Victim Interviews—victims in the Experimental-Control stores who were robbed in March, April, June, or July were interviewed (N=51).

CHAPTER II. FREQUENCY AND COST OF ROBBERY AND OCCURRENCE IN TIME

A. Robbery is Theft, Through Force, by Strangers

Conklin (1972) calls robbery the "bellwether" crime in America today. "There are many reasons why robbery is the best indicator of the type of crime most feared by the public. One is that robbery is almost always committed by a stranger in an unexpected and highly threatening manner. While such crimes as murder, rape, and aggravated assault commonly involve offenders and victims who are known to each other, robbery rarely involves such relationships...robbery is defined as 'the taking and carrying away of personal property of another from the person and against his will, by force or violence or by assault and putting in fear, with intent to steal.' ...Not only must the victim be put in fear or have force used against him for a robbery to occur, but the assault must also be linked to the theft. Force must be used in order to take property....The crime of robbery thus incorporates two threatening elements: the use of force against the victim and theft of property" (Conklin, 1972, pp. 4-5).

Robbery is the principal source of violence from strangers (President's Commission on Law Enforcement and the Administration of Justice, 1967). According to the Uniform Crime Reports of 1973 (U. S. Department of Justice, 1974), robbery comprises 44% of the crimes of violence. In 1973, an estimated total of 382,680 robbery offenses were committed in the United States.

B. The Frequency of Robbery is Increasing

As indicated in Table 2-1, robbery in general increased 46% from 1968 to 1973. For the same time period the increase for chain stores has been more than three and one-half times as great—up 167% in 1973 over 1968 (see Table 2-2). Chain store robberies are the category in which convenience store robberies are tabulated.

For the 24 hour convenience food store the experience has been similar with an increased frequency of robbery over the last few years. As distinct from the Uniform Crime Reports which present increases in relation to the number in some previous reporting period, the data from the present study show frequency in relation to the number of targets.[1] As indicated in Table 2-3, robberies in the convenience food stores in the present study rose from .55 per store per year to over .92 robberies per store per year for the stores nationally. The present study was conducted in the Western Division of this national chain and the experience was similar, although even higher. Roughly speaking, the expected frequency of robbery is one robbery per store per year.

C. Death from Robbery is Infrequent

Death as a result of robbery is rare. Data from 1970 through the first half of 1975 for the Southland Corporation nationally indicate that in 17,649 robberies, 69 deaths occurred for a proportion of .0039, or one death every 256 robberies (see Table 2-4).

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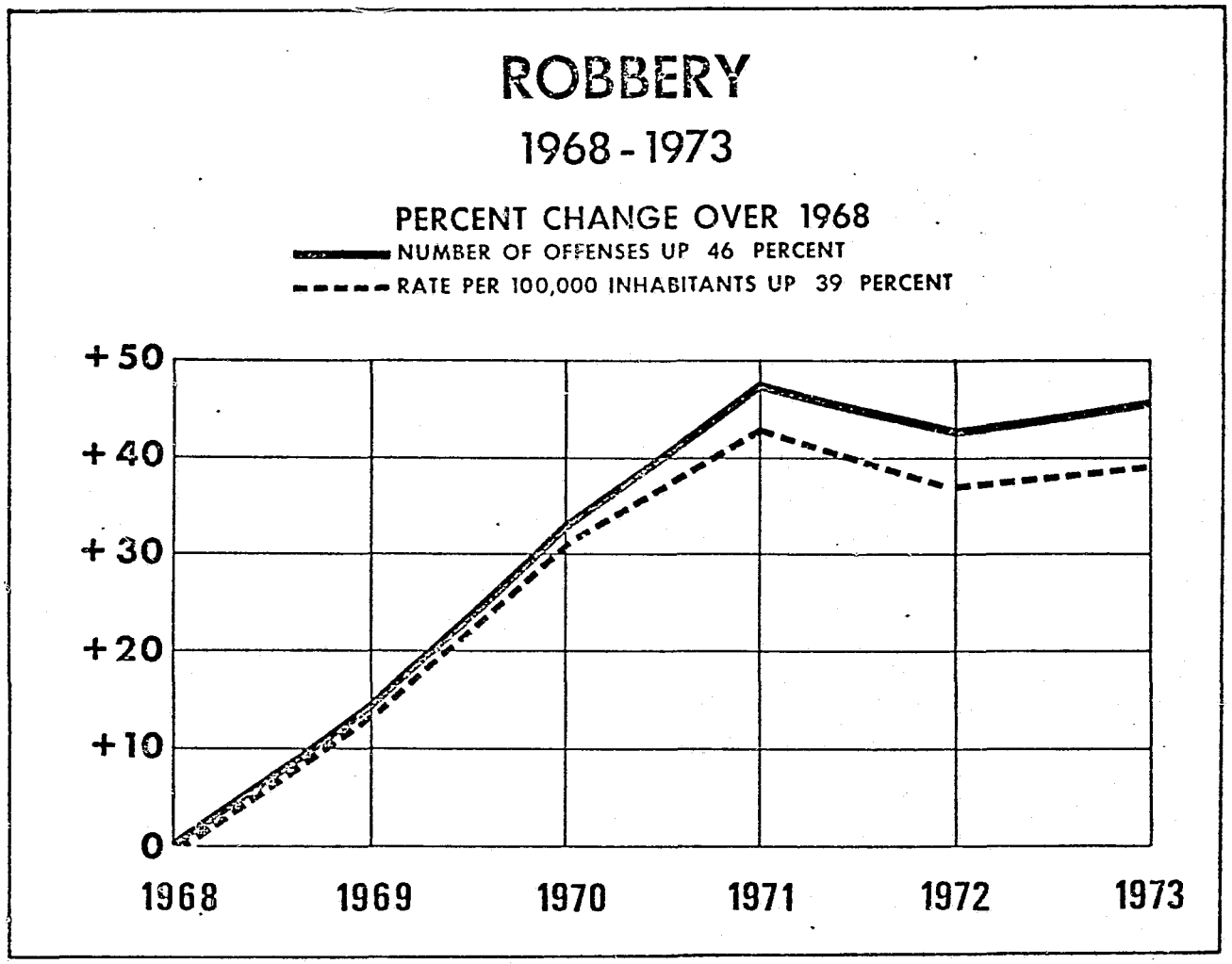
[1]Comparable data are only now becoming available. See for example: U. S. Department of Justice, Law Enforcement Assistance Administration, National Crime Panel Surveys. Criminal Victimization Surveys in 13 American Cities. Washington, D.C.: Government Printing Office, 1975.

Table 2-1. National robbery data for 1968-1973



Reproduced from United States Department of Justice, Federal Bureau of Investigation. Crime in the United States. (Uniform Crime Reports, 1973) Washington, D.C.: U. S. Government Printing Office, 1974. Document Stock No. 2701-0012. P. 16. 1974 edition not yet available.

Table 2-2. National robbery of chain stores for 1968-1973

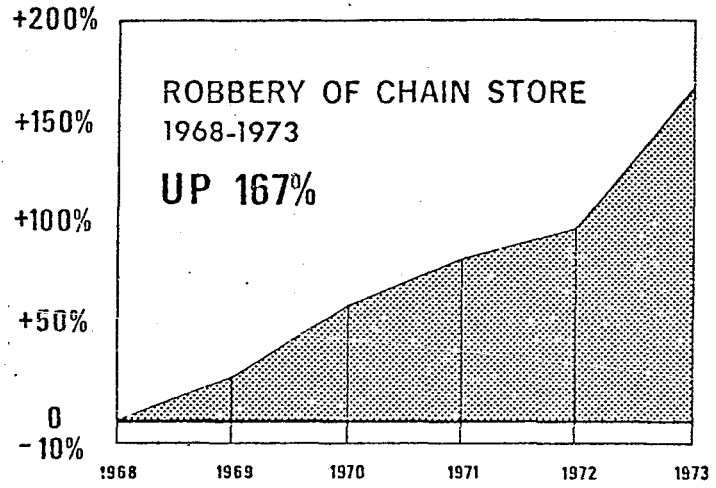


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Table 2-3. Western Division and national robbery frequency for Southland stores for 1970-1975

	1970	1971	1972	1973	1974
Western Division					
Robberies	291	308	370	537	645
Store-years*	379	375	446	492	550
Robberies/Store-year	0.77	0.82	0.83	1.09	1.17
National					
Robberies	1974	2236	2710	3571	4718
Store-years*	3600	3783	4359	4702	5115
Robberies/Store-year	0.55	0.59	0.62	0.76	0.92

*Summation across stores of proportion of year store was open.

Table 2-4. Deaths as a percentage of robbery in Southland stores nationally for 1970-1975

	Robberies	Deaths	Deaths/Robbery*
1970	1,974	10	.0051
1971	2,236	12	.0054
1972	2,710	15	.0055
1973	3,510	9	.0026
1974	4,678	16	.0034
First half 1975	2,541	7	.0028
Totals	17,649	69	.0039

*Non-significant decrease at the .10 level by a Kolmogorov-Smirnov one-sample test. Siegel, S. Nonparametric statistics for the behavioral sciences. New York: McGraw-Hill, 1956, 47-52.

Dealing in very round numbers, when robbery frequency is about one robbery per store per year, and where, as in the present case, the stores are open 24 hours a day, 365 days a year, then approximately for every 2,000,000 hours of store operations, one death will occur. Stated in a different way, the chances that a death from robbery will occur in any particular store are once every 256 years. However, the foregoing analysis does not take into account the exposure rate, i.e., the number of people who are at risk during store operating hours. Analysis of injuries is difficult to assess because standard definitions have yet to be applied. The injury data of the present study must be used with caution because the distinction cannot be made between degrees of injury with certainty (see Table 2-5). In 95% of the robbery cases no injury of any kind occurred. Some injury (however slight) did occur in one out of every twenty robberies.

There is an important trend in the death data which should be noted. The death rate per robbery appears to drop from 1970 through the first half of 1975 with a decided break between 1972 and 1973. Statistical analysis reveals that this apparent decrease could have occurred by chance ($p \leq .10$). It is therefore not valid to say that deaths per robbery are increasing. However, public statements that robberies are becoming increasingly more violent are not borne out by the experience of these stores regarding robbery murders.

D. Economic Loss is a Minor Cost of Business

The amount of money taken in robberies is an additional cost but not as great a cost as many might think. The average loss per robbery for these stores was $154 nationally and $123 for the Western Division stores. The

Table 2-5. Injury from robberies for 1974 population

Injury	Number	Percentage
None	357	94.7
Slight	7	1.9
Medical attention	6	1.6
Workmen's compensation	5	1.3
Death	2	0.5
Totals	377	100.0

reduced loss for the Western Division is attributed to past campaigns in that area to reduce the cash kept on hand.

Dollar loss from robbery is a very small percent of the sales volume of these stores and very small in relation to losses from other sources. For the stores in the study population the annual sales volume was $175,350 on the average, and the average dollar loss per robbery was $119. As a proportion of sales, dollars lost were .0007. As a cost of business, it was relatively insignificant as indicated in Table 2-6.

It would seem very important for those concerned with the reduction of robbery to know that they face a very unfavorable cost/benefit ratio. From a purely hard-headed business perspective there is little to be gained in reduced costs from robbery prevention efforts. Only very small expense for these efforts would be justified according to a strictly "rational" economic decision-making process. Support for robbery prevention efforts therefore depends on other considerations such as concern for personal safety, effects on employee morale and turnover, customer relations, reluctance of people to invest in a franchise if the business is believed to be dangerous, etc. Investigation of these costs was beyond the scope of the present project. Some indication that employee turnover could be a significant economic cost was obtained in interviews with store employees who had been robbed. When asked, "Have you quit?", 30% said yes and 70% said no. Of those who had quit, 50% said it was because they had been robbed.

These data are only indicative of a possible additional economic expense of robbery. A very intensive study would be required to accurately

Table 2-6. Typical minor expenses as a percentage of total sales volume*

Minor Expenses	% of Sales
Utilities	3.0
Rent	2.8
Equipment	2.0
General & Administrative	1.5
Supervision & Auditing	1.0
Advertising	0.6
Maintenance	0.3
Loss from Robbery	0.0007

*From Southland Corporation, Regional Data.

estimate the loss from employee turnover and other ripple effects, particularly in an industry where high rates of employee turnover are customary.

As a cost of doing business, the economic loss from robbery is negligible except to the unfortunate individual store owner who is unlucky enough to be robbed or when the loss is aggregated on a national level. Support for robbery prevention efforts is therefore unlikely to come from company managers or industry groups as a result of economic pressures from robbery losses in their businesses, but from concern for employee safety.

Efforts to reduce the dollar loss per robbery rests on the assumption that as the amount lost decreases it will affect the frequency of robbery. That is, if the "take" is small enough, robbery won't be worthwhile for a significant number of robbers. Support for this view has come from reports of success of "no change" policies used by some bus companies and service-station operators. Small retail stores cannot operate on a no-change basis under current business practices. However, the effect of a "minimum change" policy on robbery frequency needs to be systematically tested in retail stores, not primarily to save money but to reduce the frequency of robbery and thereby reduce the threat of injury and death.

E. Robbery is Seasonal

Robbery is seasonal with these stores, with a greater frequency during the fall months of October, November, and December (see Table 2-7). As such robbery appears to follow the economic trend of greater retail sales in the last quarter of the calendar year. Contrary to what might be expected, the peak does not occur during the summer months when there is high unemployment

Table 2-7. Frequency of robbery by month and quarter for 1974 population

	Months*		Quarters**	
	N	%	N	%
January	37	9		
February	27	7		
March	31	8	95	25
April	23	6		
May	29	8		
June	29	8	81	21
July	18	5		
August	31	8		
September	42	11	91	24
October	28	7		
November	53	14		
December	36	9	117	30
Totals	384	100	384	100

*$\chi^2(11) = 28.75$, $p < .01$

**$\chi^2(3) = 7.20$, $p < .06$

in the age-group most likely to commit robbery.

It is possible that some part of the seasonal occurrence of robbery is due to the seasonal difference in the number of daylight hours rather than being an economic cause. Such an "equinox effect" could be determined from examination of robbery frequency data in relation to geographic areas on a north-south axis. Establishing such a cause-effect relationship, however, would add little of practical interest to the information presently in hand.

F. Robberies Occur Equally Throughout the Week

Again contrary to expectation, robbery is not a weekend crime—but instead occurs every day in the week. The differences in daily frequency in Table 2-8 are only chance fluctuations. These results indicate that there would be no advantage to be gained by concentrating prevention efforts during any particular part of the week.

G. Most Robberies Occur at Night

There are important differences in the time of day at which robberies occur—it is predominantly a nocturnal commission. As indicated in Table 2-9, 84% of robberies occurred between 6:00 in the evening and 6:00 in the morning. These are roughly the hours of darkness. Nighttime robberies occurred three and a half times more often between 9:00 p.m. and 3:00 a.m. than they did between the early evening hours of 6:00 and 9:00 p.m. and the early morning hours between 3:00 and 6:00 a.m.

There is no difference between frequency of robbery before midnight and after midnight. For any 4-hour period, the highest frequency occurs during midnight and 3:59 a.m., the highest frequency for a 2-hour period is

Table 2-8. Frequency of robbery by day of week for 1974 population*

	N	%
Monday	50	13
Tuesday	57	15
Wednesday	41	11
Thursday	57	15
Friday	56	15
Saturday	51	14
Sunday	63	17
Totals	375	100

*$\chi^2(6) = 5.52$, not significant.

Table 2-9. Time of day of robberies for 1974 population

		Number	Percentage
Day	6 AM — 6 PM	53	16.1
Night	6 PM — 9 PM	40	12.1
	9 PM — 12 PM	95	28.7
	12 PM — 3 AM	120	36.4
	3 AM — 6 AM	22	6.7
	Totals	330	100.0

during 1:00 a.m. and 2:59 a.m. The single hour of greatest frequency occurs between 1:00 a.m. and 1:59 a.m.

The results have obvious implications for robbery reduction strategies in concentrating efforts during nighttime hours. The concentration during the late nighttime hours is also the time of low sales volume (see Table 2-10). Prevention techniques which would not be feasible during periods of heavy customer traffic might be acceptable during a period of low volume particularly when the danger of robbery is greatest.

H. Robberies Take a Very Short Time to Commit

Typically, the victim is unaware in advance that a robbery is going to take place. Only 33% of the victims noticed the robber outside or inside the store before the robbery. In 53% of the cases, the first indication of robbery was when the victim was suddenly confronted with a weapon.

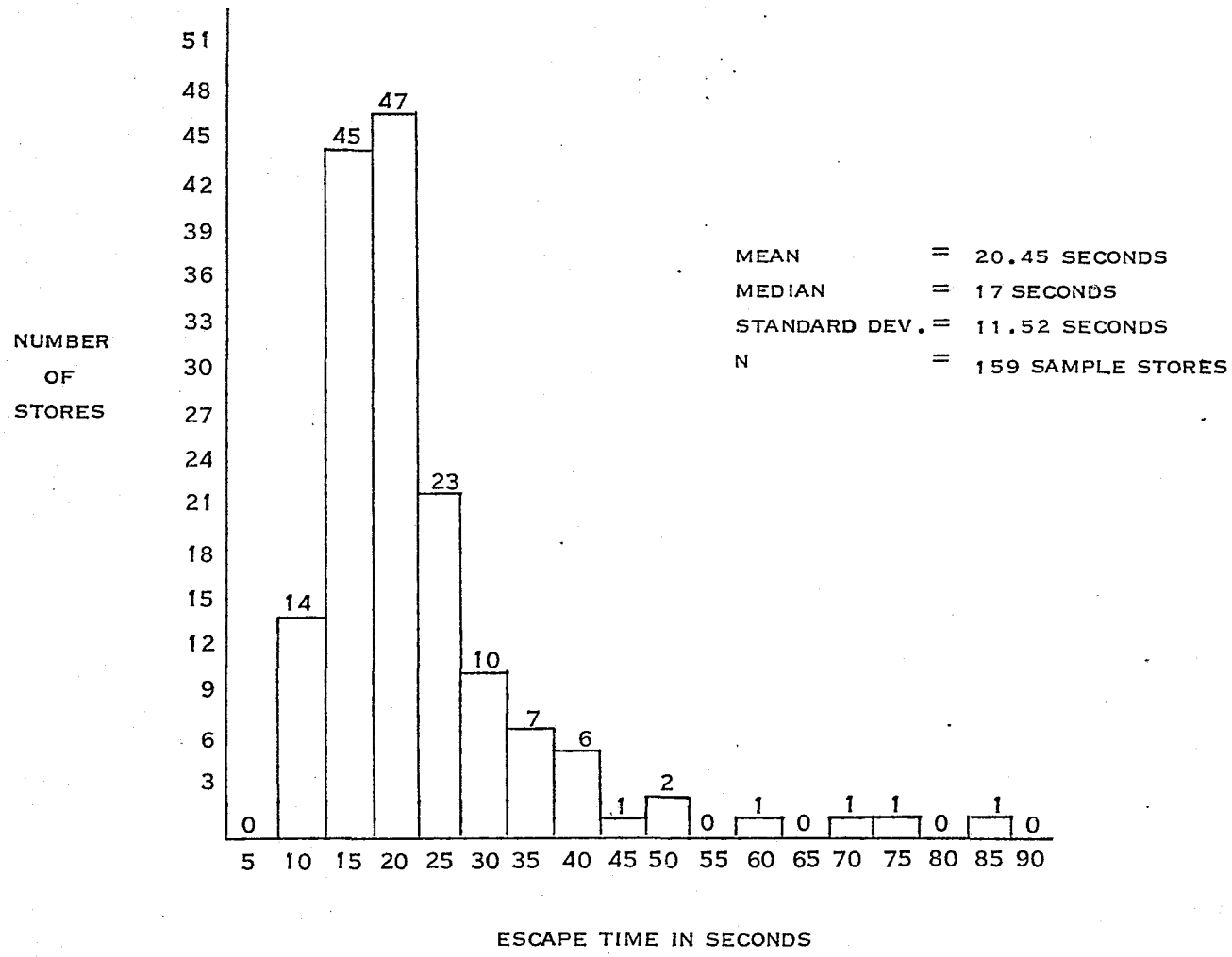
It typically takes very little time for the robber to issue his commands, obtain compliance, and secure the money. Victims' estimates of the length of time from the start to the end of the robbery averaged two and one-half minutes. In spite of the fact that subjective estimates of time are unreliable, particularly during a period of stress and excitement, there appears little doubt that the typical robbery is swift. The time of exit is equally brief. In the process of evaluating the escape routes for each store, former armed robbers timed with a stop watch how long it took to get from the store to a getaway car. Walking briskly, but in a manner unlikely to attract attention, they moved from a position near the cash register to the place outside where a robber would most likely park. Table 2-11, presents the results for a sample

Table 2-10. Percentage of customers and robbers in the store, by time of day

Time of Day	(Percentage) Customers*	Robbers**
7 AM — 11 PM	19.1	3.6
11 AM — 3 PM	21.6	3.6
3 PM — 7 PM	24.9	4.9
7 PM — 11 PM	26.1	21.7
11 PM — 3 AM	5.7	43.5
3 AM — 7 AM	2.6	22.7

*From Southland Corporation, 1974 Annual Report.
**For 1974 population.

Table 2-11. Escape time from store to getaway car



of 159 stores. In half the stores, the exit time was only 17 seconds or less and on the average about 20 seconds.

Putting the information together, a complete robbery from the time anyone knows it is a robbery until the robber is in his escape car is less than 3 minutes on the average, and in many cases less than a minute. Obviously this is a very small amount of time for anyone outside the store to notice what is taking place and a very short interval for police response even if the alarm were given. Consequently, interruption of robberies in progress by police is infrequent.

Interference by others is also infrequent; of the 51 robberies studied through victim interviews, in only 5 (10%) did a customer or any other person enter the store during the course of the robbery. And since in 82% of the robberies there were no customers in the store at the time, there are few witnesses to identify the robber should a suspect be later apprehended.

The brief period of exposure due to the short time it takes to complete the robbery and the few witnesses other than a usually startled and frightened clerk perhaps account in large part for the low rate of closure of robbery cases.

The percent of the time that a clerk is ordinarily alone in the store, i.e., when no customers are present, is not known. However, the high percentage of time (82%) that there were no customers at the time of the robbery strongly suggests that the robbers waited either inside or outside the store until customers left. If that is the case then it creates an opportunity for preventive action. Exploitation of the opportunity would require a means to identify potential robbers before the act and a course of action on the part of the clerk

that is effective and feasible. (See Chapter VI for examples of such prevention strategies.)

As a guide to robbery prevention strategies, the results presented above can be summarized as follows:

- Robbery is increasing more frequently than other serious crimes.
- Robbery is the primary source of violence from strangers.
- The expected frequency of robbery for convenience stores exceeds one robbery per store per year.
- The expected frequency of death for any particular store is once every 256 years.
- The dollars lost from robbery is a negligible expense of doing business.
- Robberies occur more frequently during the late fall.
- Robbery is not a weekend crime but occurs every day of the week.
- Robbery is a nighttime crime—it occurs five times more often at night than during daylight hours.
- Robbers probably wait inside or outside the store for customers to leave.

CHAPTER III. THE EXPERIENCE OF THE ROBBERY VICTIM

A. At the Outset the Victim is Alone and Busy Working

During the late night hours, when robbery usually occurs, the convenience store is typically isolated from other businesses, because it remains open after other establishments have closed. The clerk is typically a young, white male, who is working alone.[2] The nighttime clerk is generally very busy and is expected to restock the shelves and clean the store. Prior to the robbery, the clerks reported doing the following types of things: "I was...

- in the back of the store stocking the shelves in the cooler.
- straightening up the store, bringing all the merchandise up to the front.
- in the back room getting stock—candy and cigarettes.
- fixing the ice cream in the freezer.
- sweeping the parking lot.
- standing up front washing the front door windows."

The victim is usually alone when the robbery begins. In 82% of the cases, there were no customers in the store when the robbery began. (In only 10% of the cases did someone enter during the robbery.) A robber will often loiter in the store waiting for other customers to leave.

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[2]The results in this chapter are based on interviews with victims of all robberies occurring in the sample stores during March, April, June, and July, 1975 (N=51).

In 57% of the cases, the robbers posed as customers and hung around inside the store. "A guy came in and was looking at a magazine for about ten minutes." Or, "They acted as if they were going to buy some beer." Sometimes, the robber-to-be actually moved the clerk to another part of the store on the pretense of needing help finding something, such as "Sangria Madria," "cold wine" or "crackers." Oftentimes, they were actually making a purchase of cigarettes or a beverage, and at the time the register opened, they declared their robbery intent. In only a small proportion of those cases in which a clerk's suspicion was aroused did he have any opportunity to call for help.

B. Announcement of the Robbery is Terse and Frequently Non-Verbal

For the robber, a critically important juncture is his actual disclosure of his intent to rob. The announcement of the robbery varies with these kinds of commands:

- This is a robbery.
- Give me the money.
- Give me all your money or you'll be dead.
- You know what I'm doing, don't you?
- OK, put the money in the brown bag for me.
- This is it, your money.
- You know what I want, give it up.
- Get back against the wall.
- How would you like to die?
- Open the register.

- Up with your hands you mother-sticker—this is a fuck-up.

But in some cases, showing a weapon is itself the command:

- A guy walked in and put a bottle of beer on the counter and pulled out a gun from his waist.

- The customer left, and I looked up and this guy was pointing a gun. My mind wasn't there. I just didn't conceive of it right away.

- One of the guys pulled a knife on me from the front counter, and the other guy came in back of me. That's it.

- I rang up the cigarettes and then I looked up and right then he was pulling out a gun. He didn't have to say anything.

- When I looked up at him, he had a gun in his hand. I didn't understand the first words he said.

In any event, in 82% of the cases, the robber actually displayed a weapon to the clerk.

C. The Weapon is Concealed in the Robber's Clothing

In over 80% of the cases, the robber was wearing clothing which concealed a weapon:

He had his long black coat like a raincoat—out of nowhere came a crowbar.

When he came in he was wearing an overcoat. He pulled out a sawed-off shotgun.

Only about one-fifth wore disguises, but two of them were as follows:

I saw two men, out of the corner of my eye, with nylon stockings over their faces.

I glanced over and noticed this guy had a bag over his head.

D. The Episode is Typically Brief but Occasionally Complex

Typically, the robbery is carried out by a young male alone, and the robbery is accomplished in very short time. Here is one description:

> I was in the back room washing off the tops of the trash cans because we were having inspection the next day. I walked out and moved behind the counter to dry off my hands with some paper towels. There was a guy standing at the counter. I hadn't noticed him until I went around the counter. I said, "Hi, can I help you." He raised a shotgun and said, "Yes, this is a robbery." I raised my hands, walked over to the register, and he said, "Don't hit any silent alarms or anything or you're dead." I opened up the register, took all the money out—change and the bills—put it in a 7-Eleven bag. He told me to get down on the floor and said if I called the police, he would blow me away. He went out the door. I counted to about three and stuck my head up to see which way he had gone. Then, I got up and called the police.

Sometimes, the case is rather bizarre, as in this example:

> One of the guys that came in had been in before. He always wore the same hat and everything. On the night I got robbed, he came in and bought a chain from the leash rack up here for a dog and left. Later on in the evening, he came back with another guy—a much larger guy. They stood outside for a couple of seconds and he came in first—the guy that was in earlier. As soon as he walked through the door, the guy outside looked around and came right in after him real fast. The guy that was in before pulled out a knife and the larger guy pulled out a gun. He told me to come out from behind the counter and to the back room. When I was opening the back door I heard some noise out in front. It sounded like things crashing, metal jingling and then I heard the register open. When I bent over to pull the bolt up—there's a big bolt on the bottom of the door—I braced myself on some bottles. I guess the guy thought I was going to get a bottle and hit him or something, and the guy with the knife jabbed my arm. He didn't say anything, he just jabbed it. I said a few choice words to him and I opened the back door. The leash he had bought earlier was hanging on the fence. They put it around my neck and pulled it tight. It was like a choker chain. He told me to stand on my tiptoes. I guess, so I couldn't get out or something. He then pulled it tight.

> As they were running away, the only thing they said was, "See you in church." They were kind of chuckling about the whole situation. That was the whole thing. They just took off—a bunch of weirdos.

E. Victims Were Cooperative

The majority of robbery victims studied were cooperative upon learning that they were about to be robbed. They obeyed the robber's commands, did not argue or resist the robber and were not attacked by the robber. Only a quarter of the victims had some kind of weapon in the store, and it was rarely used during the robbery.

Although anecdotes frequently supplied by law enforcement persons are widespread concerning victim-precipitated violence in robbery, robbers occasionally assaulted the victim seemingly without cause or with what appeared to be unnecessary force to accomplish the robbery. There was violence in 17% of the cases. During the course of this study, one victim was shot and killed. In the following victim report, the clerk was led down a grocery aisle in search of merchandise, when, as he recalled,

> Before I knew it, this other guy had walked in. As I faced the guy who just walked in—he had this long black raincoat—out of nowhere came a crowbar. Without saying a word, he just started beating on me. As soon as I saw the crowbar, I knew what was coming. What I thought at that very moment was, "Did I do something wrong to this guy?" I came to the conclusion that it was a robbery. He had not said a word and I had not said a word. He just started beating on me. After the first blow, I went down to the floor. I tried to cover my head with both of my arms and that is how I got the busted left arm. This was happening in the aisle and I was scrambling on the floor trying to get away from him. Somehow, during the beating, I got in front of the Slurpy machine—I was like sitting up in front of the machine. He was still beating away...I had locked the register before and had the keys in my hand but had

> dropped them when this guy was beating on me. I told him I needed the keys to open the register and that I had dropped them when the guy was beating me, and that if he would get me the keys I would open it. . . . After I opened the register I did as they told me. I ran to the back and waited two or three minutes; then I looked out and I didn't see anybody so I came out. I got the keys from the register, locked both doors, called the sheriff and an ambulance, and I waited. It took about three or four minutes for them to get there.

In such a case, the victim had no opportunity to demonstrate cooperation with the robber, whose violence was clearly unnecessary.

A critical period of the robbery occurs when the robber has obtained the "loot" and needs to in some way dispose of the victim. That is, he needs to find a way of leaving without being attacked by the victim in the process. To the problem of departure the robber often took his chances, and employed no distinct strategy; in nearly one-half of the cases, the clerk was simply left standing by the cash register as the robber fled out the store. In one-fifth of the cases, the victim was forced to the rear of the store, and in another one-fifth, was made to lie down on the floor. In a few cases, he was forced off the premises, sometimes being told to run away from the store as fast as he could. Less than one-fifth of the victims attempted to follow or chase the robber and only about one-fourth of the time did the victim see any getaway vehicle. Ninety-four percent had the police phone number on the telephone and were able to call the police almost immediately after the robber's departure. (In about one-third of the stores, the robbery was reported by means of a silent alarm.) The robbery victims estimated an average elapsed time of almost five minutes before the arrival of the police, although the accuracy of such an estimate must be judged in light of the circumstances.

F. The Experience Has an Emotional Aftermath

Experiencing a robbery often has emotional repercussions for the victim. Some victims appear relatively nonchalant: "It was just another experience of being robbed." Others were more shaken, as the clerk who said of his second robbery: "I didn't feel that bad in the first robbery—with the gun, but with the knife...." One clerk indicated that for a period of at least two weeks after, he suffered disruption of sleeping and eating habits. Some began closing their stores during early morning hours. Many altered their money policies, for example: "The amount of money I keep in the register now is much less."

The most common impact has been that of being more suspicious of people, as shown by these comments:

> I try to pay more attention to the customers when they come in. Especially when they are going to pay me and start to put their hand inside their pocket.
>
> You get the feeling that when somebody comes through the door, are they or aren't they?
>
> I don't think I'm as cheerful as I was before.
>
> I'm not as open and free with people as I was.

CHAPTER IV. CHARACTERISTICS OF ROBBERS AND THEIR PERSPECTIVE

A. Most Robbers were Alone, Young Males of all Races, With a Handgun

Convenience store robbers typically operate alone. Three out of five robberies were by single robbers as indicated in Table 4-1. The robbers tended to be young males as shown in the same Table, and they were of all races. The percentages for ethnicity cannot be interpreted as indicating a disproportionate participation by minorities, since they are not adjusted for age, socioeconomic status, and unemployment.

In two out of three robberies, a handgun was used, as shown in Table 4-2. In 13% of the robberies, a weapon was indicated but not shown.

B. The Robber is "Cool" and Rarely High on Drugs or Alcohol

In only 8% of the cases studied[3] did the robber appear to the victim to be under the influence of alcohol or drugs. One such case follows:

> We were busy. He came in and leaned over the counter and said, "You know what I'm doing, don't you?" Of course, nobody knew what he was doing. He looked like he was on a high of some kind. I was about to close the cooler doors. I went around to the cooler and he met me again and said, "This is going to be a hold-up." Again I said, "Well, I'm going to get these cooler doors closed before it's 2:00 a.m." He acted a little aggravated, so I thought maybe I better go back behind the counter. He followed me, and told me to get the money out of the drawer. This time, he started to wave a knife. There were two or three employees in the store at the time and about five or ten customers, so he

[3]The results in this chapter are based on interviews with victims of all robberies occurring in the sample stores during March, April, June, and July, 1975 (N=51).

Table 4-1. Characteristics of robbers in 1974 population robberies

Characteristic	N	%
Number		
One	216	58
Two	133	36
Three	19	5
Four +	3	1
Age		
Under 20	110	22
20-29	333	68
30-39	41	8
40-49	9	2
Ethnicity		
White	238	45
Black	175	33
Brown	119	22
Sex		
Male	523	98
Female	18	2

Table 4-2. Type of weapon used in 1974 population robberies

Weapon	Number	Percent
Handgun	240	64
Rifle	17	5
Shotgun	10	3
Knife	41	11
Club	9	2
Threat/not visible	48	13
More than one type	8	2
Totals	373	100

> wasn't in very good shape—he didn't know what the hell he was doing. We thought, "Well, since we don't have too much money in the drawer anyway, no big loss," so we took the money out and gave it to him.

The victims were asked if the robber lost his cool, and in 80% of the cases, they said he did not. A few of those said the robber(s) might have if provoked. One clerk said, "When I started fighting back, he lost his cool." The victims were also asked if the robber seemed jumpy, and they said he usually wasn't, for example:

> No. They were real calm. In fact, maybe they had been in prison for the same thing.
>
> He didn't seem jumpy. He seemed pretty cool. I was more jumpy than he was.
>
> No. He seemed very sure of himself.
>
> He didn't seem nervous at all.

Almost twice as often as not, the victims thought the robbers were amateurs. As one clerk stated: "Amateurs, I would say. It looked like one was showing the other." Usually the clerk thought the robber was professional if he used authority in dispatching his commands.

C. The Robber Has the Victim Handle the Money

In most cases, the robber had the victim open the cash register, and in almost half the cases had him sack the money. One-fourth of the time, the robber demanded money from the safe, and in 40% of the cases he took the bills only, leaving the silver behind. Rarely did the robber take other property or merchandise or the victim's money. In all but one robbery, the robber exited through the same place he entered.

D. The Robber Does not Take Steps to Prevent Pursuit

In the 51 cases studied, the robber never bound, gagged or blindfolded a victim. In only one robbery each was the telephone or alarm deactivated or were fingerprints removed. In 20% of the robberies, the robber had the victim lie down on the floor, and in only 12% was the victim even requested not to tell, such as: "Don't call anybody for five minutes after we leave," or another who said, "Don't try to take our license number." On only two occasions, the victim was placed in the back room. As described in the previous chapter, one victim was chained to a fence to prevent pursuit. In an unusual case, the victim had a lead for pursuit of the robbers, which was delayed by police action:

> When the robbers left the store, I ran after them to see which direction they were heading. I ran back in the store and called the police. They came after about two or three minutes. I was standing outside to direct them (the police) to where the robbers had gone. They thought I was the guy who robbed the store. They made me freeze over there and pointed guns. After that, they put the cuffs on me and made me sit in the car. I was telling them that I was not the guy who robbed the store, and that I was the guy who called them. They wouldn't listen. They still thought I was the guy who robbed the store. After about five or six minutes, the police searched the store. Nobody was in the store except me, so they realized that I was the guy who called. That really amazed me. I was the guy who called, and they put cuffs on me. Really shocked me.

While robbers usually do not take steps to prevent pursuit it is not advisable for the victim to do so. Fortunately, in the above case, no shooting took place.

E. The Robber's Perspective Provides a Guide to Prevention

Using the foregoing information and drawing on the personal

experience of ex-robbers and other specialists, an analysis was made of those factors which influence the behavior of the robber at the scene of the crime. The important questions of the general causes of crime and criminal behavior were left aside and instead, the focus was upon the robber's behavior from the time he arrived until he left. The attempt was made to account not only for the so-called professional criminal who is believed to plan his crime carefully, but also for the "spontaneous" robber who may not consciously analyze his target at all. Such a robber's behavior is believed to still be influenced by the characteristics of the site if through no more than the inarticulate feeling that "things look right" or that it gives off "bad vibes." The approach would not apply to someone with a strong psychological disturbance or whose normal functioning is grossly distorted as by chemicals. However, as indicated by the results above, the great majority of robbers are "cool" and sober.

In analyzing the situation from the robber's point of view, three concepts were used. The first is an initial motivation to commit robbery, which leads the robber to search for a suitable target. The second concept is the robber's image of what constitutes a suitable target, which has led him to approach a particular potential target site. The third concept is the physical and behavioral characteristics of the potential robbery site, which lead the robber to proceed with his initial motivation to rob, or to wait until conditions become favorable, or to leave the scene.

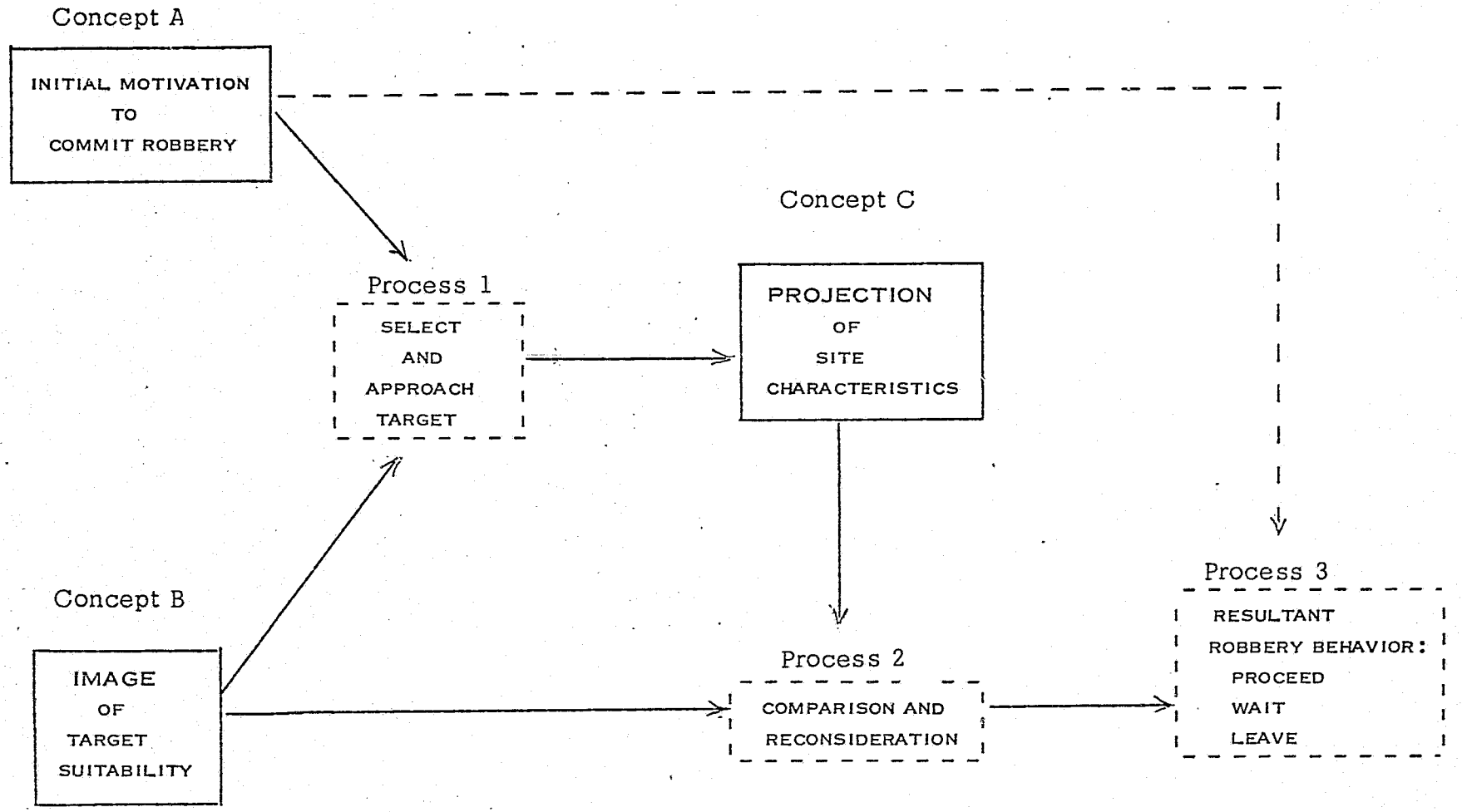
These three concepts give rise to three behavioral processes. The first process is the initial selection and approach to the potential robbery site,

which results from the robber's initial motivation and his image of target suitability. The second process is a comparison and reconsideration, which results from the robber's image of target suitability and the actual characteristics of the site. The third process is the subsequent behavior of the robber to proceed, to wait, or to leave, which results from a combination of preceding concepts and processes. For example, a robber might proceed with the robbery despite the fact that the site does not fit his image of suitability if his initial motivation were sufficiently intense. The model is presented in Figure 4-1.

The rationale for the present research was to change Concept C—the characteristics of the site—because they are more directly accessible to manipulation, and because they have been relatively neglected. The other concepts are also subject to manipulation and are the basis for other crime reduction strategies. For example, stiff penalties are believed by many people to influence Concept A, the initial motivation to rob. Concept B is also accessible to manipulation; for example, public announcement of a police "crackdown" on liquor store robberies could eliminate that whole class of potential sites as suitable targets for some robbers—at least temporarily.

The present research, concentrated on Concepts B and C and Process 2 in order to change Process 3. That is, it considered the relationship between the robber's image of target suitability, and the projection of suitability given by the characteristics of the site, in order to change the comparison and reconsideration process and result in the robber leaving.

Figure 4-1. Descriptive model of the robbery process

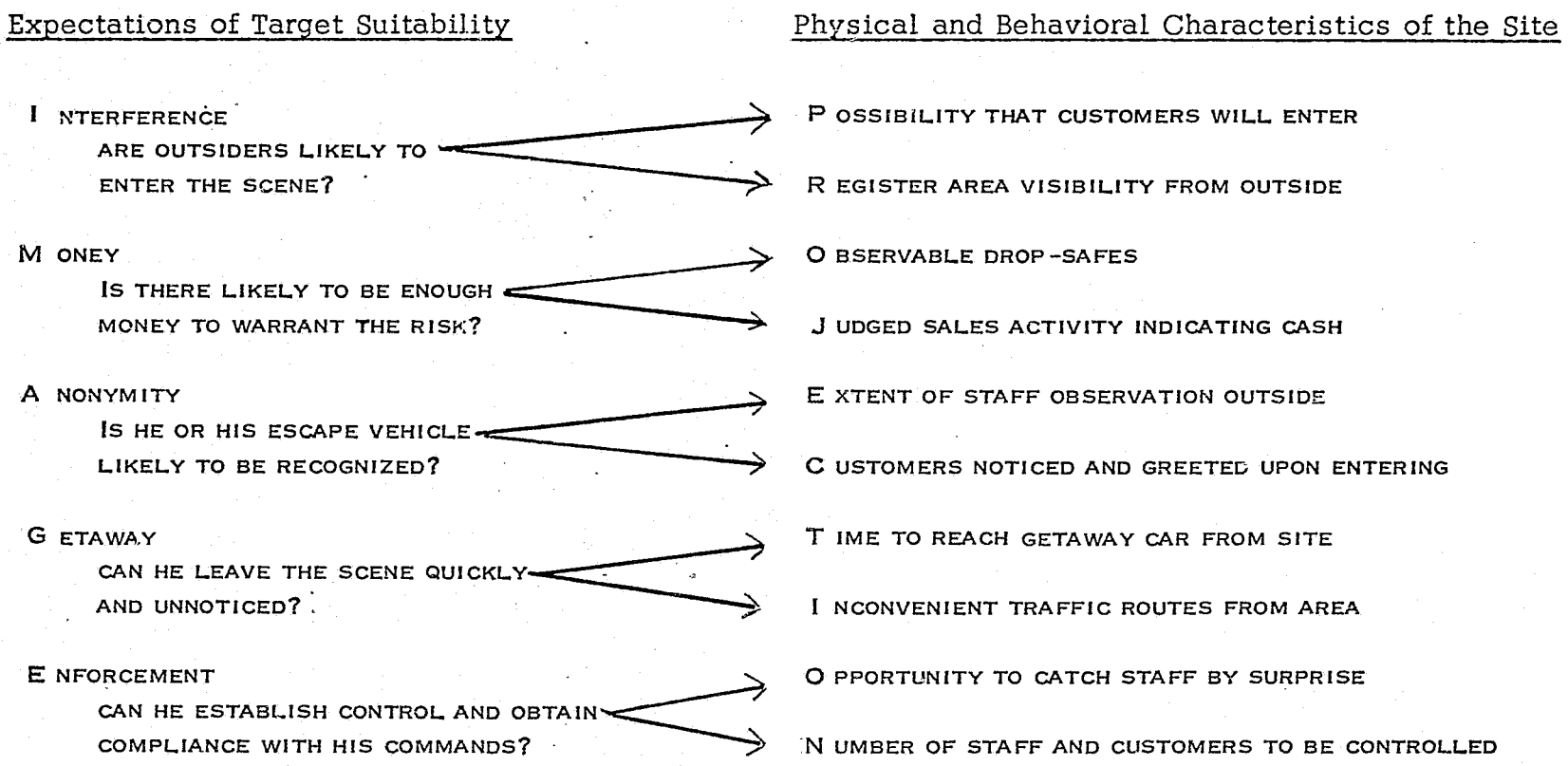


With the help of former armed robbers, police robbery specialists, private security managers, store owners, and hundreds of visits to stores, the concepts of the Robber's Image of Target Suitability, and the Projection of Site Characteristics linked to the image, were analyzed into their most important components.

The two concepts are organized into the IMAGE-PROJECTION model presented in Figure 4-2. On the left are the elements of the robbers' IMAGE of target suitability. On the right are store characteristics believed to be related to the robber's image. Two of the many store characteristics for each element of the robber's image have been selected and arranged to spell PROJECTION. This was done as a memory aid and to emphasize that it is only those characteristics which are projected that can be expected to influence the robber's behavior. The PROJECTION list should be considered as merely examples or hypotheses of potentially significant site characteristics. It remains for research to establish a definitive list.

As organized in this model, the robber's perspective guided the development of the prevention procedures described in Chapter VI, and formed the basis for the staff training and physical changes that were made in the field experiment in Chapter VII. Before turning to these topics, an examination was made of the differences between stores that were frequently or seldom robbed.

Figure 4-2. Descriptive model of the comparison-reconsideration process



CHAPTER V. THE DIFFERENCE BETWEEN FREQUENTLY AND INFREQUENTLY ROBBED STORES

A. A Few Stores Had Most of the Robberies

Robberies could have been spread evenly over all the stores, but that is not the case. Some stores had no robberies, some only one, and others had two or more. According to Table 5-1, 72% of all robberies occurred in only 27% of the stores. Robbery frequency therefore is concentrated in a small number of stores. This is an important consideration for a strategy to reduce crime through physical and behavioral changes at the target site. If the techniques are successful, then the expense of implementing them in frequently robbed stores can be justified, since the overall reduction in robbery would be large. For example, a 50% reduction in robberies in the 27% stores most frequently robbed would mean an overall reduction of 36% for the total population of stores.

B. Robbery Experience was Consistent from Year to Year

It is important to know if the frequency with which stores are robbed is a consistent factor or merely transitory. To answer this question, the frequency with which stores were robbed in one year was compared to the following year. A consistent pattern emerged, with stores frequently robbed one year being frequently robbed the next year.

Robbery frequency for stores in 1973 was correlated with frequency for the same stores in 1974 and 1975. Between 1973 and 1974 the correlation was .30 significant at the .001 level with an N of 106. Between 1974 and 1975

Table 5-1. Distribution of robberies in 1974 population stores

Times Robbed	Number of Stores	Number of Robberies	% of Stores	% of Robberies
0	146	0	42	0
1	109	109	31	28
2+	94	275	27	72
Totals	349	384	100	100

the correlation was .18, significant at the .05 level with N of 120. Most remarkably, the correlation between frequency of robbery in 1973 and 1975 was .20 significant at the .05 level with N of 106. While these relationships are low, they are statistically significant and indicate that stores robbed frequently one year are still being robbed frequently two years later. This is a very stringent test of the consistency of some stores to be robbed less than would be expected by chance and others to be robbed more often.

However, there is still a large element of chance involved. The relationship between frequency one year and the next is low. That there be a relationship is an essential requirement for a strategy of changing store characteristics—that some stores are consistently robbed more frequently and some less frequently than others. It would be more favorable to the strategy if the relationship were high but at least the minimum requirements were met. It is particularly remarkable that the relationship holds up over a period of two years in spite of all the changes in personnel and operating conditions that take place.

These results are also important for implementation strategies because since there is consistency, the prior robbery experience can be used to identify those stores most likely to be victimized in the future.

C. Robbery Frequency is Not a Chance Event

The foregoing sections indicate that there is a pattern for some stores to be robbed frequently and others infrequently, and that there is consistency in the pattern from year to year. The relationship, however, is weak, and a sizeable element of chance is involved. In order to analyze

this chance factor more closely than the previous data permitted, the Poisson distribution was used.

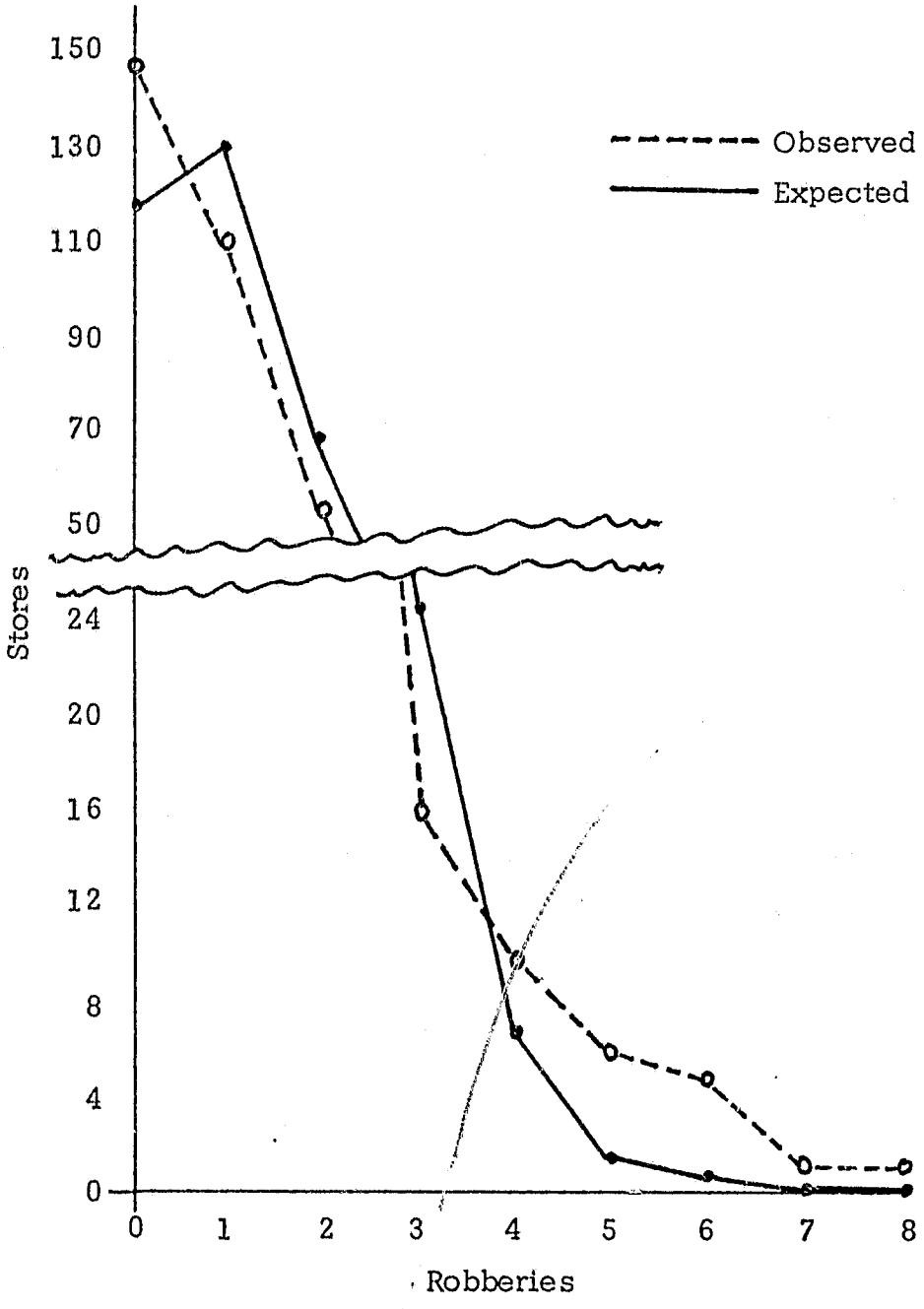
The Poisson distribution represents the number of stores one would expect to be robbed 0 times, the number robbed 1 time, 2 times, and so on, given that robbery is a random event. These expected values are generated according to the definition of the Poisson distribution:

$$p(k;\lambda) = \frac{\lambda^{k} e^{-\lambda}}{k!}$$

where $p(k;\lambda)$ equals the probability of a store having k robberies, given that the overall probability of a store being robbed is λ, with λ value computed dividing the total number of robberies by the total number of stores. These probabilities were then used, when multipled times the total number of stores, to estimate the number of stores that should be robbed k times if robbery is indeed a random event with probability λ. This expected distribution was then compared to the observed distribution with a computed χ^2 to assess differences between the two distributions. This analysis indicated a significant difference, $\chi^2(8) = 17.53$, $p<.05$ and an examination of the graph of these data in Table 5-2 reveals this difference to be due to some stores being robbed less often than would be expected by chance and some stores more often.

These results are consistent with the basic strategy of the present research. They do not establish that robbers are selective in their targets, but they are entirely consistent with that belief. The results obtained are exactly what would be expected if robbers selectively avoided certain stores and were attracted to certain others. There are, however, other possible

Table 5-2. Observed distribution of robberies in population stores compared to expected Poisson distribution



explanations which were examined.

D. Stores in Low Class Neighborhoods Were Not Robbed More Often

A possible explanation for the fact that some stores are robbed less often and others more often is their location—the socioeconomic status of the neighborhood the stores are in. Neighborhood status was measured by the use of census tract data. In a previous study at WBSI, a social area analysis of the 1970 Census was made. A factor analysis of 124 indicators from the census was performed and yielded three major factors—socio-economic, family, and ethnic status. Two measures loaded most highly with socioeconomic status—mean housing value and percent high school graduates 25 years and over. These measures were obtained for the census tract in which each of 311 stores was located. There was no relationship between the socioeconomic status of the neighborhood and the frequency with which the stores were robbed ($r = -.08$, n.s.), as presented in Table 5-3.

These results indicate that for these stores the socioeconomic characteristics of their location is not a significant robbery factor. The data do not bear on the larger question of the relation between crime and socioeconomic condition, because the sample does not accurately represent all business enterprises nor are the stores distributed proportionally in all economic areas. However, the widely held belief of a strong relationship between high crime rates and lower class neighborhoods has been challenged

Table 5-3. Correlation of socioeconomic status, sales volume, and attractiveness to robbers with robbery frequency

	Robbery Frequency
Socioeconomic status	—0.08*
Sales volume	0.01*
Attractiveness to robbers	0.17**

*These correlations are not significant ($p > .05$) with N=311, population stores.
**Significant ($p < .05$) with N=159, sample stores.

as an artifact of data gathering practices by Boggs.[4]

E. Stores with High Sales Volume Were Not Robbed More Frequently

Robbery frequency was also not related to a store's sales volume. The annual gross sales volume was correlated with robbery frequency and there was no significant relationship ($r = .01$, n.s.) as shown in Table 5-3.

F. Stores That Are Attractive to Robbers Were Robbed More Often

Drawing on the findings presented in the previous chapters, particularly the analysis of the robber's perspective, a set of 22 scales were devised to measure a store's vulnerability to robbery. Staff members who were formerly armed robbers and behavioral scientists in two two-man teams visited a sample of 159 stores during nighttime hours in November of 1974 and again in May, 1975.

Each member of the team independently rated each store and gathered other information reported in Chapter VII. The characteristics of the sites which were believed to be related to attractiveness for a robber could be reliably measured. That is, the independent judgments by the staff members agreed to a high degree. Table 5-4 presents product moment correlations between raters for each store. In addition, agreement for each scale was assessed by computing correlations between the ratings over the total number of stores for each scale. These results are presented in Table 5-5 and again indicate a high degree of agreement.

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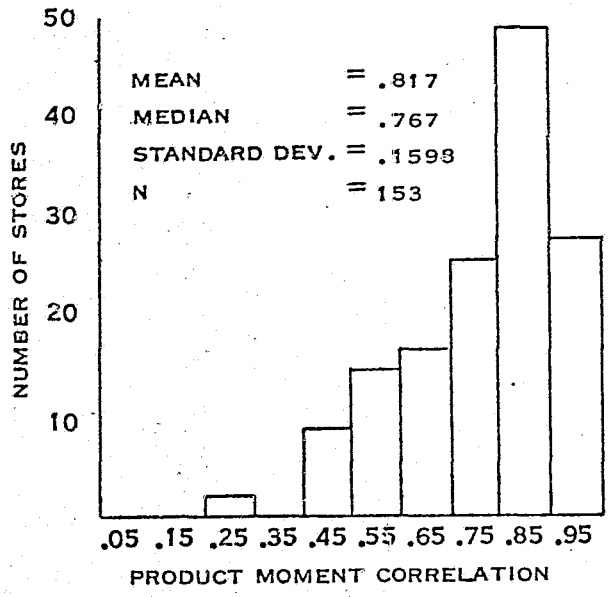
[4]Boggs, S. L. Urban crime patterns. American Sociological Review, 1965, 30(6), 899-908.

Table 5-4. Reliability correlation between raters for each store for 22 rating scales for sample stores

November, 1974



May, 1975

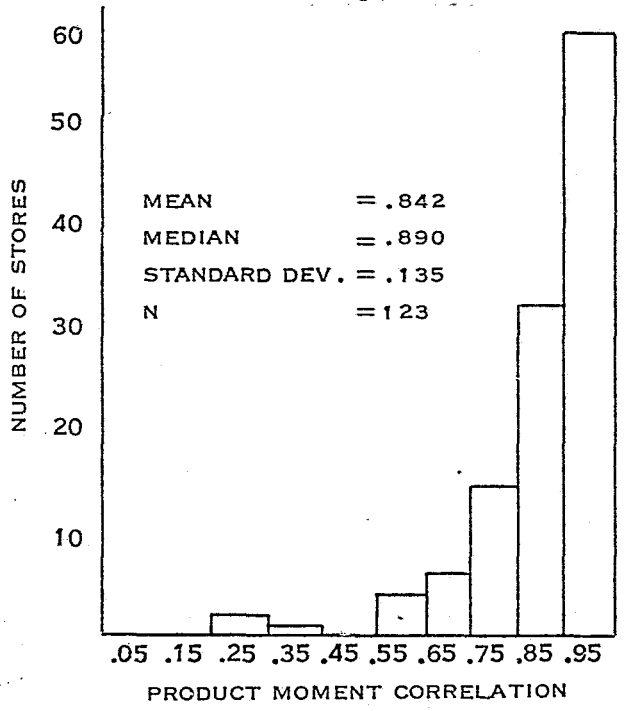


Table 5-5. Reliability correlations between raters for each scale over all sample stores

	November 1974*	May 1975**
Escape path to car	.82	.76
Escape route from area	.79	.78
Outside lighting	.61	.75
Car visibility from store	.57	.78
Car visibility by pedestrians	.57	.75
Overall escape difficulty	.73	.77
Staff alert to outside	.75	.62
Greets entering customers	.51	.80
Staff alert to inside	.43	.48
Neatness of store	.38	.54
Overall impression of staff	.42	.70
Activity nearby	.80	.83
Activity in store	.73	.85
Robber visibility from outside	.47	.81
Cash register visibility	.60	.78
Cues that warn robber	.73	.85
Overall chances robber seen	.47	.79
Drop safe visibility	.60	.90
Inaccessibility sign on safe	.73	.89
Sign of bill-cashing limit	.31	.90
Overall expected take	.77	.69
Overall attractiveness	.75	.75

*N = 153

**N = 123

As a final step in the rating procedure an overall measure was made. On a scale from 0 to 9—attractive/unattractive—the rater responded to the question, "All things at the site considered, how attractive is this store as a robbery target?" As indicated in Table 5-3 this rating was significantly correlated with previous robbery frequency. The correlations of the individual sub-scales with robbery frequency were very low and generally not significant. In order to identify which of the factors contributed to the overall rating, each sub-scale was correlated with it. As indicated in Table 5-6 many of the sub-scales were significantly correlated with the overall rating.

The finding that overall rated attractiveness was significantly related to robbery frequency, while socioeconomic status and sales volume were not, supports the basic research approach. However, while the relationship is significant, it is low. This seriously raises the question of whether or not manipulation of the attractiveness variable could reasonably be expected to affect robbery frequency. Furthermore, the low relationship suggests that either a large element of chance enters into which stores are selected to be robbed or that there are additional variables not encompassed by the present research which are strongly related to robbery frequency, but have not yet been recognized.

Using the best information available from the results presented in foregoing chapters and drawing on the experience of ex-robbers, police robbery specialists, private security officials, store managers, clerks, and behavioral scientists, a set of procedures was developed with the expectation that the relationship between attractiveness to robbers and robbery frequency,

Table 5-6. Correlation of subscales with overall attractiveness for sample stores, November, 1974

Scales	Mean	SD	Correlations with Overall Attractiveness
Escape path to car	3.19	1.84	0.54***
Escape route from area	2.69	1.85	0.47***
Outside lighting	5.34	1.44	0.13
Car visibility from store	2.36	1.37	0.31***
Car visibility by pedestrians	3.55	1.71	0.39***
Overall escape difficulty	3.01	1.70	0.66***
Staff alert to outside	5.38	1.90	0.08
Greets entering customers	6.00	1.31	-0.02
Staff alert to inside	5.82	1.08	0.20*
Neatness of store	5.93	1.07	0.10
Overall impression of staff	5.07	1.27	0.39***
Activity nearby	3.47	2.24	0.19*
Activity in store	3.41	1.89	0.14
Robber visibility from outside	5.18	1.47	0.09
Cash register visibility	4.75	1.71	0.22*
Cues that warn robber	2.26	2.27	0.09
Overall chances robber seen	5.06	1.44	0.19*
Drop safe visibility	3.65	2.52	0.06
Inaccessibility sign on safe	2.06	2.34	0.08
Sign of bill-cashing limit	1.20	2.14	0.34***
Overall expected take	4.05	1.59	0.29**
Overall attractiveness	3.92	1.52	1.00

NOTE: The N for all variables is 120.

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

while low, would be sufficiently strong to reduce robberies.

As a guide to robbery prevention procedures the results of this chapter indicate the following:

- Only 27% of the stores accounted for 72% of the robberies.
- The frequency with which stores were robbed was inconsistent from year to year.
- More stores had zero robberies and more stores had frequent robberies than would be expected by chance.
- The socioeconomic status of a store's neighborhood was not related to robbery frequency.
- The sales volume of a store was not related to robbery frequency.
- The attractiveness of a store to robbers can be reliably measured.
- The more attractive a store is to robbers, the more frequently it was robbed.

CHAPTER VI. PROCEDURES FOR PREVENTING ROBBERIES AND AVOIDING VIOLENCE

A. Prevention Procedures Used the Robbers Perspective

The techniques for preventing robberies include the strategic placement of new signs in the stores, physical changes, a list of robbery prevention procedures, and a list of violence prevention procedures to be posted in the stores and to serve as a guide to training clerks and managers.

The purpose of the signs, physical changes and robbery prevention procedures was to discourage a potential robber, without turning away customers. The rationale behind the procedures was to look at the stores from the robber's point of view and then devise countermeasures to dissuade him. The ideas for prevention came from law enforcement personnel, security personnel, store managers, the literature analysis of data, and ex-robbers on the WBSI staff.

The robbery prevention procedures were a series of general and specific messages designed to deter potential robbers, including those who were casually entertaining the idea of robbery as well as those who were carefully planning it. Some preliminary consideration on the part of the robber was assumed in all cases.

As discussed in Chapter IV, the potential robber was assumed to have made a preliminary selection of a site and had approached it. At the scene, the characteristics of the site and the behavior of the store personnel lead the robber to reconsider his selection and then either proceed with the

robbery, wait until conditions become favorable, or leave. The intent of the prevention procedures was to build into the site those characteristics possessed by stores that were seldom robbed and to eliminate features found in stores that were frequently robbed.

Certain procedures (good external lighting and clear windows, for example) provided the store with an external image which might discourage a potential robber. Other features (an alert clerk or a blocked escape route, for example) were designed to further inhibit a robber's plans. Still other features (signs posted in the store and direct verbal and non-verbal communication from the clerk, for example) were designed to influence those who actually entered the store with the intention of robbing it. From the robber's perspective, an ideal convenience store robbery might include the following considerations:

- be sure there is money to be had
- optimize the take-risk ratio
- be persuasive (that is, terrorize the victim into giving up the money without resistance)
- avoid disruptions during the course of the robbery
- get the money quickly
- avoid being seen by anyone but the victim
- avoid robbing those who deserve not to be robbed
- avoid being recognized
- get away quickly and easily

From the point of view of robbery prevention, countermeasures were then devised along the following lines:

- maximize positive identification with those elements of the community with which robbers are thought to identify
- persuade the robber there is little money to be had
- maximize the perceived risks for the robber
- maximize the probability of the robbery being witnessed from both outside and inside the store
- convince the robber he may be recognized
- if possible, alter escape routes or otherwise provide obstacles to quick and easy exit by the robber

B. Signs Communicated Low Cash on Hand

Four signs, of a decal nature with white lettering on a green background were used. These signs were used to alert the customers. Other prevention procedures were directed to employees.

PLEASE PAY WITH SMALLEST POSSIBLE BILL—
WE KEEP MINIMUM AMOUNT OF MONEY ON HAND

This sign, placed on the door for the customer to see as he enters, gave early indication that responsibility for keeping a low cash level was shared by clerk and customer alike. It told the prospective robber that robbery would not be worthwhile. The dual message was reinforced by the other signs in the store.

WE APPRECIATE EXACT CHANGE

Placed on the counter near where the customer would normally place goods about to be purchased, this sign was an obvious way of enabling

a store to keep a low cash volume. Though some may think this would be offensive to customers, it is a practice established successfully by filling stations, taxi-cabs, and bus drivers.

REGISTER HAS LESS THAN $35. AT NIGHT ALL
$20s, $10s, $5s ARE PUT IN LOCKED SAFE

This sign was located on the front of the cash register and near the register window where it would likely be seen by the customer on the completion of a sale. It is believed that thirty-five dollars would not be worth the risk of five years to life for a prospective robber. Its message was reinforced by that of the fourth sign:

CLERK CANNOT OPEN THIS SAFE

This sign is placed on the outside of the drop-safe. In conjunction with this, the drop-safe should be in a conspicuous location. A prospective robber should be able to see this sign before he initiated a robbery, only to be surprised to learn that the clerk did not have access to the safe.

Taken together the signs convey the message that a robbery would not be worthwhile.

C. Physical Changes Increased Visibility and Blocked Escape

Physical changes were sometimes necessary to decrease a store's vulnerability in terms of visibility and escape route access. Consideration of visibility include how well the robber could be seen from the outside, by people passing by either on foot or in cars, how visible the cash register was from the street, and how visible the drop box was within or outside the store. Considerations of escape include the escape path from the store to

the car, the escape route after reaching the car, and the amount of time it takes to reach the car from the cash register area.

Changes which could alleviate problems of visibility included increasing the level of lighting outside of the store, removing signs and moving displays which obstruct the interior of the store, and by placing the cash register and drop box in more conspicuous locations.

The alteration of escape routes involved building small fences or gates between the store and an adjacent building or fence, the use of concrete bumpers or chains to block parking lot entrances and exits, or the construction of low fences on top of existing walls which would make it difficult for the robber to park in adjacent property and leap over the wall after leaving the store.

The objective behind the manipulation of escape routes was to make it difficult for the robber to park an escape vehicle anywhere but directly in front of the store. Some store locations made it impossible to effectively block the best available escape routes to the robber. This was especially true of stores located at intersections, where a prospective robber might easily park at the curb on either street. Some elements of the escape route after the robber had reached his car were also not subject to manipulation. For instance, some stores were conveniently located by freeway entrances, thus providing excellent escape possibilities not subject to modification.

Other possible changes of a varied nature are noted below:

- a "buddy system" between two or more nearby merchants during the late night hours whereby one could alert another to suspicious persons

or situations. This might take the form of a simple buzzer between adjacent businesses, or a voice communication network.

- a large flat mirror located above and behind the cash register area and canted on an angle in such a way as to enhance the visibility of activities inside the store, in the vicinity of the cash register, to persons outside.

- balanced lighting inside and outside the store during the night to minimize the mirror effect for the nighttime employee and which can make almost anything going on outside the store invisible from the inside. It is extremely difficult to see outside a store whose interior is brightly lit because the windows become mirrors to anyone inside. This is often the case even for those stores with adequate external lighting. It may be that the only solution to this problem is to reduce the level of lighting inside the store while at the same time enhancing external lighting so as to balance the two while maintaining visibility in both directions.

- taxi-cab companies may be persuaded to locate a cab stand or rendezvous point in the store parking lot. This would supply virtually continuous witnesses to events in and around the store, and robbers would be aware of the fact that cabs have radios for efficient communication in the event of an emergency.

- free coffee for police officers or other late-night visitors.

- police radio calls broadcast within the store, providing the robber with a reminder of the staff's alertness and perhaps a suspicion of some exclusive communication link with the police.

- a reward offered by the company or employer to a clerk who turns over to the police information on loiterers found to be armed or wanted.

- the installation, in certain stores, of a bell alarm system activated by an electric eye or hose (as in service stations) to alert the clerk to the presence of a car passing through or parking in an area behind or near the store which is not visible from within. Such a device would be applicable to any situation in which the clerk needs to know about the presence of a vehicle parking in a location where no customer would normally park.

D. Behavior Changes Were Made Through Training

The robbery prevention procedures, discussed in the paragraphs below, were posted in the store as reminders to the employees, and they were trained in the rationale behind each procedure.

ROBBERY PREVENTION PROCEDURES

To help keep robberies from occurring in the first place, the owner of the store you work at is cooperating with the Southland Corporation and WBSI in making certain physical and procedural changes at your store.

The idea is to unnerve nervous would-be robbers, while they are still deciding whether or not to rob your store, and to turn them away by doing things they don't like, or that disappoint their hopes:

- GIVE YOUR STORE A LOOK THAT SAYS, "WE ARE VIGILANT."

A HALF-ASLEEP CLERK IN A SLOPPY STORE INVITES WOULD-BE ROBBERS. TO THEM, SUCH A CARELESS SCENE MEANS THAT YOU MUST BE CARELESS WITH MONEY, TOO. SO, TO GIVE OFF THE RIGHT VIBES:

--GET OUT FROM BEHIND THE COUNTER WHEN THE STORE IS EMPTY.

--KEEP THE STORE CLEAN.

--KEEP THE STORE UNCLUTTERED:

--KEEP THE STORE WELL-STOCKED.

--KEEPING THE STORE LOOKING GOOD WILL ALSO KEEP YOU ACTIVE, WHICH WILL TURN AWAY SOME ROBBERS, BECAUSE IT WOULD TAKE THEM TOO MUCH TIME TO GET YOU BACK TO THE CASH REGISTER. ROBBERS PREFER BRIEF ROBBERIES.

The robber's presumed selection of certain stores as desirable robbery targets makes robbery a predatory phenomenon. Clerks were therefore encouraged to do things that would give their store a clean, alert and well-kept appearance, an appearance which would be reinforced by good

overall lighting. Alert activity on the part of the clerk would enhance this impression and would tend to keep him away from the cash register. The clerk behind the cash register was seen as especially vulnerable to a quick, easy robbery; if working in some other part of the store, the robber would have to bring the clerk back to the cash register area (usually by posing as a customer).

- PUT THE ROBBER ON STAGE.

  ROBBERS DON'T WANT TO BE VISIBLE FROM OUTSIDE. THEY DON'T WANT ANY POLICE WHO MAY PASS BY TO SEE THEM WITH A GUN IN HAND, HOLDING YOU UP. SO:

  —AFTER DARK, WHEN MOST ROBBERIES OCCUR, BLOCK OFF "HOT SPOTS" WHERE ROBBERS COULD STAND AND NOT BE VISIBLE FROM OUTSIDE.

  —TAKE DOWN OR MOVE SIGNS AND DISPLAYS THAT BLOCK THE VISIBILITY OF THE CASH-REGISTER AREA FROM OUTSIDE.

Because stores which might provide the prospective robber with a hiding place from which to rob the clerk are presumed to be desirable, steps were encouraged to increase the visibility of a robbery from outside the store. Toward this end, clerks were encouraged to move displays in such a way as to remove "hot spots"—that is, locations from which a robber might confront the clerk without being observed from the street. Signs and displays should be moved during the nighttime hours especially, so as to give the store a "gold fish bowl" appearance. In this case, the clerk is encouraged to take whatever steps reasonable which will improve the visibility of the cash register area from the street.

- KEEP A SHARP LOOK-OUT.

  —FROM TIME TO TIME, LOOK AT ANY LIKELY "CASING" PLACES, SUCH AS OUTDOOR PHONE BOOTHS, OR CARS PARKED ACROSS THE STREET OR IN THE LOT BUT OFF TO ONE SIDE.

  —SEE IF ANYONE IS WATCHING YOU OR THE STORE, WAITING FOR YOU TO BE ALONE.

  —IF ANYONE IS WATCHING OR LOITERING THERE, STARE HIM DOWN.

  —IF HE STILL DOESN'T GO AWAY, CALL THE POLICE. TELL THEM WHERE YOU ARE AND WHAT YOU SEE. DO IT OPENLY, TO SCARE HIM AWAY.

  —THE POLICE WELCOME SUCH CALLS. THEY PAY OFF OFTEN ENOUGH.

The store employee was encouraged to be alert to surveillance locations outside the store from which a prospective robber might observe the store while considering a robbery. Further, the clerk was encouraged to be conspicuously and aggressively alert in his counter-surveillance of possible robbers or others loitering outside the store. He was encouraged to "stare down" the outside loiterer, conspicuously recording the license number of his car, going outside the store to get a better look if necessary. If such behaviors did not scare away the suspect, the clerk was encouraged to call the police and again to do so within conspicuous view of the person being reported.

- GREET EACH PERSON WHO COMES IN.

  A ROBBER DOESN'T WANT TO BE IDENTIFIED. HE WANTS TO ROB STRANGERS, WITH AS LITTLE HUMAN CONTACT AS POSSIBLE. SO:

  —GIVE EVERYONE A FRIENDLY GREETING.

  —LOOK EACH PERSON IN THE EYE.

  —KEEP A FRIENDLY EYE ON HIM.

  —THIS HUMAN CONTACT WILL SPOIL IT FOR SOME WOULD-BE ROBBERS. IT DECREASES THEIR ELEMENT OF SURPRISE. IT THREATENS THEM WITH THE POSSIBILITY OF BEING IDENTIFIED LATER. IT MAKES IT HARD FOR THEM TO LOITER IN THE STORE AND LOOK AT YOU SECRETLY.

  —BE MOST SUSPICIOUS OF YOUNG MALES OF ALL RACES, WEARING GARMENTS THAT COULD CONCEAL WEAPONS, WHO COME IN ON FOOT WITHOUT HAVING PARKED A CAR WHERE YOU CAN SEE IT, AND WHO LOITER OVER A TRIVIAL ITEM WAITING FOR YOU TO BE ALONE.

  —ASK THE CUSTOMER AHEAD OF SUCH A SUSPICIOUS PERSON, "ARE YOU WITH HIM?" THE CUSTOMER WILL LOOK AT HIM. THAT MAY SCARE HIM OFF. HE DOESN'T WANT TO BE IDENTIFIED LATER.

  —IF ALONE WITH A SUSPICIOUS PERSON, LEAVE THE COUNTER ON AN ERRAND IN THE STORE AND SAY, "I'LL BE WITH YOU IN A MINUTE."

  —IF STILL SUSPICIOUS, CALL THE POLICE, TELL THEM WHERE YOU ARE, AND SAY, "I REQUEST A PATROL CHECK NOW." THAT WILL SCARE OFF MOST PERSONS CONSIDERING A ROBBERY.

The emphasis here was on identifying persons entering the store and to pay particular attention to anyone who may be suspicious for any reason. Remembering that the robber would presumably choose to enter unnoticed and not be seen until he chose to actually begin the robbery, the clerk was encouraged to make human contact with every person entering, letting each know that the clerk knows that he is in the store. If appropriate,

the clerk may call on other customers to identify a suspicious person ("Are you with him?"). If still suspicious, the clerk was encouraged to call the police within earshot of the suspect. Everything was to be done which might make the prospective robber feel well noticed and conspicuous within the store. Such activities, when applied to legitimate customers, usually take the form of solicitations for patronage ("Is there anything I can help you with?").

- KEEP AS LITTLE MONEY IN THE CASH REGISTER AS YOU CAN, ESPECIALLY BILLS, AND LET THE WORLD KNOW IT.

  ROBBERS WILL EXPECT A BIG SCORE, UNLESS YOU LET THEM KNOW OTHERWISE, BEFORE THEY START TO ROB YOU. SO:

  --PUT ALL $20 AND $10 BILLS (AFTER 8 P.M., EVEN $5) INTO THE DROP SAFE AS SOON AS YOU GET THEM. DO SO PUBLICLY. TELL YOUR CUSTOMERS WHY: "SO WE WON'T HAVE ENOUGH BILLS IN THE REGISTER TO BOTHER ROBBING." THIS WILL EDUCATE THE PUBLIC, INCLUDING WOULD-BE ROBBERS, THAT ROBBING 7-ELEVEN STORES IS NO LONGER WORTH RISKING 5-YEARS-TO-LIFE IMPRISONMENT.

  --WHILE "CASING" YOUR STORE BEFORE A ROBBERY, WOULD-BE ROBBERS LOOK INTO THE CASH REGISTER WHILE IT'S OPEN DURING SALES. IF THEY SEE ONLY SILVER AND $1S, THEY AREN'T LIKELY TO ROB YOU.

  --YOU CAN RUN A STORE ON VERY LITTLE MONEY, IF YOU REQUEST CUSTOMERS TO PAY FOR THEIR PURCHASES WITH THE SMALLEST POSSIBLE BILL AND WITH EXACT CHANGE IF POSSIBLE. YOU CAN ASK FOR THE KINDS OF MONEY YOU NEED.

The clerk was encouraged to apply a strategy to the individual store which other businesses such as bus companies and late night gas stations have applied on a larger scale. That is, he was encouraged to do a variety of things which gave the person entering the store the impression that there was not enough money in the store to make the robbery worthwhile. Several things may be done by the clerk to promote this store image and reputation. Some of the signs placed in the stores are directed toward money handling policies. Reinforcing the messages of the signs with his own behavior, the clerk was encouraged to do several things that would give the store an image to all who enter that little available money is at hand. Most important, of course, is verifying that statement with the practice of not maintaining any

substantial amount of money in the cash register.

There is little doubt that many clerks feel the need to keep far more money on hand in the cash register than they in fact need to do business during the nighttime hours. In many stores, the clerk will maintain a "stash" of extra funds hidden near the cash register, as a reserve which he can feel reasonably confident will not be taken in the event of a robbery. Clerks were encouraged to view every late night customer as a potential change reserve and were reminded that almost every purchase represents a decision for the customer to either accumulate or release small bills or change to the merchant. With this in mind, clerks were encouraged to ask for small bills and for exact change as necessary.

Although clearly a large bill is acceptable in the event of a correspondingly large purchase, the concept to be promoted in the store is that accessible funds are not sufficient to give any customer a large amount of change as would be necessary in the event that a small purchase were paid for with a large bill. As the sign in one store stated, "We do not keep enough money on hand to change large bills." Money handling policies required the habitual and consistent behavior of the clerk in such a way that available funds were reduced to a bare minimum. He was encouraged never to use the cash register as a storage place for money which should be kept in the drop-safe.

- LATE AT NIGHT, TAKE SPECIAL STEPS TO MAKE YOUR STORE LESS OF AN ATTRACTIVE TARGET TO WOULD-BE ROBBERS.

  MOST STORE ROBBERIES HAPPEN IN THE DARK HOURS—AND MOST OF THOSE AFTER 9 P.M. SO, AS SOON AS YOU CAN EACH NIGHT:

  —MINIMIZE THE AVAILABLE LOOT BY PUTTING BILLS IN THE DROP SAFE.

  —KEEP NO MORE THAN $35 IN THE REGISTER.

  —BLOCK OFF ROBBERY "HOT SPOTS" AS YOUR EMPLOYER WILL TELL YOU.

  —TAKE DOWN ANY SIGNS AND MOVE ANY DISPLAYS THAT BLOCK VISIBILITY OF THE CASH-REGISTER AREA FROM OUTSIDE.

  —MAKE ANY CHANGES IN THE PARKING LOT AND LIGHTING THAT YOUR EMPLOYER WILL TELL YOU ABOUT AS PART OF THIS ROBBERY PREVENTION PROGRAM.

The convenience store is a very different type of business during the late nighttime hours than it is during the day and it can be reasonably run in a different manner without jeopardizing any substantial amount of sales activity. Staff alertness is more appropriate during the nighttime, as are clerk requests for exact change or small bills.

These procedures won't stop all robberies—but they will help to reduce the number of robberies, the amount of money lost, and the violence.

So: BE ROBBERY CONSCIOUS! AND CARRY OUT THESE PREVENTION PROCEDURES!

E. Violence Prevention Procedures Stress Cooperation

In the event that a robbery occurs in spite of the robbery prevention procedures, a technique for dealing with the situation was provided to the employees in the form of a list to be posted, as shown on the following page, and again, an accompanying verbal explanation was provided.

VIOLENCE PREVENTION PROCEDURES

WBSI's team of scientists and ex-robbers hopes that, by carrying out our Robbery Prevention Procedures, you will never be robbed.

But, if you are robbed,

- KEEP IT SHORT AND SMOOTH.
  THE LONGER IT TAKES, THE MORE NERVOUS THE ROBBER. NERVOUS ROBBERS ARE MORE APT TO PULL TRIGGERS.

- OBEY HIS COMMANDS.
  ROBBERS ALMOST NEVER HURT ANYONE WHO COOPERATES.

- DON'T ARGUE.
  IT'S TOO LATE FOR THE ROBBER TO CHANGE HIS MIND—BUT IT'S NOT TOO LATE FOR HIM TO GET ANGRY AND HARM YOU.

- DON'T FIGHT.
  THE MONEY ISN'T WORTH RISKING YOUR LIFE. TO ATTACK AN ARMED ROBBER IS FOOLHARDY, NOT HEROIC.

- DON'T USE WEAPONS.
  WEAPONS BREED VIOLENCE. THE ROBBER'S WEAPON IS ALREADY ONE WEAPON TOO MANY.

- TELL HIM ABOUT ANY SURPRISES.
  IF SOMEONE IS IN THE BACKROOM, OR EXPECTED SOON, OR IF YOU MUST REACH OR MOVE IN ANY WAY, TELL THE ROBBER WHAT TO EXPECT, SO HE WON'T BE STARTLED INTO SHOOTING.

- OFFER TO LIE DOWN.
  THIS MAY SOLVE THE ROBBER'S PROBLEM OF WHAT TO DO WITH YOU AFTER HE HAS THE MONEY. LYING DOWN IS BETTER THAN THE THINGS HE MAY OTHERWISE DECIDE TO DO, SUCH AS KNOCKING YOU DOWN OR TYING YOU UP.

- DON'T CHASE OR FOLLOW HIM.
  ROBBERS SHOOT AT PURSUERS. POLICE MAY SHOOT AT YOU, TOO, THINKING YOU'RE ONE OF THE ROBBERS.

- CALL POLICE AND STORE OWNER.
  KEEP THEIR NUMBERS AT THE PHONE. STAY ON THE PHONE UNTIL THEY TELL YOU IT'S OKAY TO HANG UP. THEN STAY NEAR THE PHONE.

- DON'T TELL OR ESTIMATE THE MONEY LOSS. KEEP SAYING YOU DON'T KNOW.
  POLICE TELL REPORTERS ABOUT ROBBERIES. IF NEWSPAPERS REPORT A LARGE LOSS, OTHER ROBBERS WILL BE ATTRACTED BOTH TO YOUR STORE AND TO OTHER 7-11 STORES. LET THE STORE OWNER GIVE THE EXACT AMOUNT STOLEN TO DETECTIVES THE NEXT DAY.

These procedures, by giving you more control of the situation, will make you less nervous if a robbery occurs, and less of a threat to the robber, so you will be safer.

However, to avoid the danger of a robbery, carry out the WBSI Robbery Prevention Procedures.

The principle behind the violence prevention procedures was cooperation with the robber. Some owners and store clerks, including those who arm themselves in anticipation of confronting a robber, prepare to be the robber's enemy. While acknowledging that some robberies result in "expressive" violence and injury to the clerk, violence prevention recommendations, like the robbery prevention procedures, were based on a model of rational robbery. The robbery event is a brief and dramatic episode of extortion, and the robber's sole purpose is to obtain money. The victim is not his enemy, but rather his temporary hostage.

In light of this, the victim should cooperate in being a hostage, rather than attempting to abort the robbery. Once the robbery has begun, the robber's and victim's purposes are identical—to complete the robbery as quickly, successfully, and smoothly as possible. This recommendation of cooperation with one's assailant flows from the dominance the robber holds over the victim and the priority of victim safety over money loss. Robbers should be dissuaded before the fact and caught after the fact, but afforded full cooperation during the event itself.

Most of the violence prevention procedures are variations on the theme of cooperation, the basic idea of warning the robber about any surprises which might occur. This approach acknowledges that violence sometimes occurs for unanticipated and unintended reasons. It is to the clerk's advantage to defuse this tense episode from any potentially startling events that might trigger spontaneous violence on the part of the robber. Another clerk may be in the back room, a customer may be about to enter

the door, or the clerk may have to reach into his pocket for the cash register key or under the counter for a paper bag in which to put the money. To advise the robber of these events in advance helps prevent inadvertent injury. Not telling or estimating money loss is expected to reduce publicity which might encourage other potential robbers who might read of a lucrative convenience store robbery.

F. Secrecy and Deception Are Self-Defeating

The foregoing robbery and violence prevention procedures all share a common property—they do not depend on secrecy or deception. The widespread practice of lying to robbers is ill-advised and, in the long run, self-defeating. Secrets cannot be kept in an industry with high employment turnover. Moreover, most clerks easily become confidential with anyone who is friendly and expresses a genuine interest. For example, Customer: "The sign says you have a silent alarm system, and my brother is thinking about getting one for his business. Are they any good?" Clerk: "Oh, that's just a sign. We don't really have one."

The self-defeating nature of such deceptions comes about when the practice becomes widespread and known, because then the deterrence benefit of a real silent alarm system is undermined. As another example, consider the sign which says, "Clerk cannot open this safe." If that is not in fact true, then that information will eventually become known. A clerk in another store who really doesn't have access to the safe is then endangered because a robber may not believe the sign and attempt to beat him into compliance.

The information presented in this and the previous chapters has indicated that a prevention strategy is possible, but the ultimate test was whether or not the approach worked in practice.

CHAPTER VII. THE EFFECTIVENESS OF ROBBERY PREVENTION PROCEDURES

A. A Formal Experimental Design was Used

In order to test the effectiveness of the robbery prevention procedures, a classical experiment was designed. Two groups of stores were selected to be representative of other stores and to be as much alike as possible. The two groups were then assigned at random either to receive the treatment of the robbery prevention procedures in the experimental group or not to receive any treatment in the control group. In this way, any differences in their robbery experience subsequent to the treatment would be due to the effects of the experimental procedures.

Since both groups were distributed at random in the same geographic area, they should be affected equally by any factors which would increase or decrease the crime rate. For example, there might be a general increase in crime rate that resulted from changed economic conditions or conversely an overall decrease caused by heightened police activity. Because such developments would affect both experimental and control stores they could be ruled out.

The results presented in previous chapters indicated that some stores were consistently robbed more often and some less often than would be expected by chance. To prevent the experiment from being biased if more of one kind of store than another should end up in either the experimental or control group, the stores were stratified on previous robbery frequency.

Stratification ensured that an equal number of stores with a history of zero, one, or two or more robberies would be chosen for the study. Since the period to test the effects was January through August, 1975, the previous robbery experience in January through August, 1974, was used to stratify the sample stores. This technique balanced any effect that the season of the year might have. Stratification diminishes not only the chances of bias but it also permits determination of differential effectiveness, e.g., if the treatment were effective only with frequently robbed stores but not with others.

The attractiveness of stores to robbers had also been found to be related to robbery frequency, and the sample was stratified on that dimension. A safety score was computed using the rating on overall attractiveness and selected sub-scales. Using this score, the entire sample was divided into equal groups, rated from one to four, with four being high safety or unattractive to robbers. As before, the stratification not only guarded against bias by preventing more of the attractive stores ending up in one of the groups but also made it possible to determine whether or not the treatment was more effective with safe than unsafe stores.

The design is illustrated in Table 7-1; the 159 sample stores were arranged into three levels of previous robbery frequency of zero, one, or two or more, and four levels of safety or unattractiveness to robbers. The design thus had twelve cells. Since five experimental and five control stores were desired for each cell (for a total of 120 stores), there were extra stores for most cells. They were kept in reserve in the event a store had to be eliminated for any reason.

Table 7-1. Stratification of sample.

Previous Robbery Frequency	Safety Score: Low 1	2	3	High 4	
2+	11	12	11	11	45
1	12	16	11	11	50
0	11	12	20	21	64
	35	40	42	43	159

Within each cell, the stores were divided into two matched groups by attempting to make them as equal as possible on as many different characteristics as possible. Following this procedure, the stores were divided into two groups of sixty (Groups A and B). Mr. Seth Burgess of the Southland Corporation then flipped a coin and by this random process, Group B was selected to be the experimental group.

B. The Experimental and Control Stores Were Very Much Alike

The previous results had indicated that the relationship between store attractiveness to robbers and robbery frequency was low. It was therefore problematic whether the manipulation of attractiveness through the prevention procedures would be strong enough to reduce robberies during the experimental period. It was for this reason that the sample of stores was stratified and matched as carefully as possible. This was done to reduce chance differences between the experimental and control groups that could obscure or mask the effect of the prevention procedures.

Also, every characteristic on which the experimental and control groups were similar at the beginning of the experiment could be ruled out as being the cause of any subsequent difference between them. That is the power of classic experimental design. The adequacy of the stratification and matching procedures was subjected to test. As indicated in Tables 7-2 and 7-3, there were no significant differences on any of the thirty-five characteristics tested. The similarity was almost perfect—nothing more could be asked from any stratification and matching procedure in an experimental design.

Table 7-2. Comparison of experimental and control stores at the beginning of the experiment

Variable	Experimental Stores	Control Stores	Test
Mean housing value	20,923	21,653	$F(1,105) < 1$
High school graduates	64.88	66.48	$F(1,105) < 1$
Mean sales volume	174,920	173,760	$F(1,137) < 1$
Mean robberies	1.21	1.09	$F(1,137) < 1$
Mean dollars lost	88.76	74.45	$F(1,137) < 1$
Mean safety score	-.21	-.27	$F(1,137) < 1$
Hours open per day			
16	8	8	
24	52	52	$\chi^2(1) = 0.00$
Special protective devices			
Yes	18	21	
No	42	39	$\chi^2(1) = 0.34$
Silent alarm			
Yes	7	7	
No	53	53	$\chi^2(1) = 0.00$
High police patrol			
Yes	21	21	
No	39	39	$\chi^2(1) = 0.00$
Both silent alarm and patrol			
Yes	2	3	
No	58	57	$\chi^2(1) = 0.21$

Note: All tests failed to demonstrate a significant ($p < .05$) difference between the two groups.

Table 7-3. Comparison of experimental and control stores on attractiveness measures at the beginning of the experiment

Variable	Mean Experimental Stores	Mean Control Stores	Test
Escape path to car	0.33	0.38	$F(1,48) < 1$
Escape route from area	1.65	1.56	$F(1,48) < 1$
Outside lighting	9.96	5.47	$F(1,48) = 1.07$
Car visibility from store	0.30	0.29	$F(1,48) < 1$
Car visibility by pedestrians	1.28	1.46	$F(1,48) < 1$
Overall escape difficulty	8.28	7.92	$F(1,48) < 1$
Staff alert to outside	0.29	0.28	$F(1,48) < 1$
Greets entering customers	1.11	1.39	$F(1,48) < 1$
Staff alert to inside	7.05	6.71	$F(1,48) < 1$
Neatness of store	0.29	0.26	$F(1,48) < 1$
Overall impression of staff	1.00	1.12	$F(1,48) < 1$
Activity nearby	5.95	7.37	$F(1,48) < 1$
Activity in store	0.34	0.30	$F(1,48) = 1.10$
Robber visibility from outside	1.15	0.78	$F(1,48) < 1$
Cash register visibility	6.62	5.74	$F(1,48) < 1$
Cues that warn robber	0.32	0.33	$F(1,48) < 1$
Overall chances robber seen	0.88	1.03	$F(1,48) < 1$
Drop safe visibility	5.22	6.08	$F(1,48) < 1$
Inaccessibility sign on safe	0.34	0.33	$F(1,48) < 1$
Sign of bill-cashing limit	1.05	1.08	$F(1,48) < 1$
Overall expected take	7.86	7.74	$F(1,48) < 1$
Overall attractiveness	0.32	0.32	$F(1,48) < 1$
Arc of visibility*	113.12	178.70	$F(1,48) < 1$
Money in register	63.58	77.06	$F(1,48) < 1$

Note: All tests failed to demonstrate a significant difference ($p > .05$) between the two groups.

*The angle measured in degrees of the visible outside area from the top of the cash register.

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1 OF 2

C. The Robbery Prevention Procedures Were Implemented in the Experimental Stores

One reason that field experiments are infrequent in the behavioral sciences is the difficulty that can be encountered in implementation. The difficulties were successfully overcome and need not be detailed here, but over a ten-month period covering an area one-half the size of the state of Massachusetts, working the hours of dusk to dawn, the field staff made 1,075 store visits. The stores were franchised, and each owner had to be individually persuaded to cooperate. Employee turnover was 80%. Because the study area included over thirty different law enforcement jurisdictions, rare breakdowns in coordination with them produced a few frightening confrontations between the field staff and the law.

Several methods of training were employed during the course of the project. The first of these involved four collaborative planning seminars with store owners. The owners were briefed in robbery and violence prevention procedures by way of having them make presentations of the prevention material. Four video tapes were made of their presentations. These tapes were then shown at a second series of meetings which were attended by clerks. At these meetings, the staff discussed prevention procedures with employees in order to reinforce and elaborate the original message made by their employers, and to answer questions. The response to this approach in terms of attendance was disappointing and it was discontinued.

Because of an unexpectedly high turnover among store employees, and lack of attendance at the first sessions in December, training sessions

were conducted by staff at a series of locations chosen to be convenient to groups of stores throughout the project area during the first two weeks of January. For most of this effort, an unfinished house trailer was rented and towed from meeting to meeting. The meetings were held for employees of clusters of stores, with from two to seven stores represented at each meeting. The sessions were conducted by a panel of three ex-robber WBSI staff members.

These same staff members later made a cassette tape recording of their presentation which was used in individual presentations carried to employees in visits to stores during working hours. This last process was continued throughout the experimental period, as new clerks replaced others who left. The cassette tape proved to be a useful way of conveying needed information to the clerk, and provided for quality control in that all clerks were provided the same information. The presentation on the tape was supplemented with discussion and elaboration by the training staff person. The clerk was provided with printed copies of robbery and violence prevention procedures at the time of the taped presentation which he could review and re-read later. A copy of each was posted in the rest room of each store, at eye level, approximately three feet above the floor, where they could be reviewed periodically.

In all, 669 people (owners and employees) worked in the 72 experimental and reserve stores during the project period. Of these, 527, or 79%, were trained, an average of 7.3 per store. In the original plan of the study the training of clerks was to have been done by the owners and the

added burden severely strained staff resources, the budget, and relations with the project monitor.

Each of the experimental stores was visited during the hours of darkness, and a prescription was made to overcome any features that made the store attractive to robbers. Any physical modifications were discussed with the franchise owner and with the appropriate Southland managers. No major physical changes on the order of remodeling were made. Some physical changes desired by the project staff were so expensive as to be unfeasible. Other, less expensive, but still costly changes, could not be made because the Southland Corporation suffered a temporary drop-off in sales due to the recession and any non-essential expense was vetoed. Consequently, the physical changes made were no- or low-cost items. The best example of no-cost changes involved the removal of advertising signs and banners from the front windows of the store, particularly those in front of the cash register area. In most of the experimental stores, the windows were substantially cleared of such signs so that there was increased visibility into and out from the store.

In other cases, changes would not have been expensive but were resisted by owners for other reasons. Although recommendations that drop boxes be moved to a more conspicuous location were made in 37 instances, in only a few cases could such a move be documented. Obstructing counters were lowered on two occasions, and in two instances (out of 58 recommended) new exterior lighting was installed. Other miscellaneous recommendations, such as the installation of chains blocking entrance or exit from a parking lot, the construction of low fences, exterior mirrors, etc., were not

completed. However, the four types of new decal signs were installed in all experimental stores.

Early in the study it appeared that the prevention procedures had not been sufficiently implemented and that January, 1975, should not be included in the experimental period. Subsequent experience showed that because of high employee turnover, the training before January 1, 1975, compared favorably with the 80% rate maintained through the other months. Also in January, it was anticipated that far more physical changes would be made than actually took place. Therefore, January was included in the experimental period.

D. The Prevention Procedures Reduced Robberies

The robbery experience of the experimental and control stores was followed for the eight-month period from January 1 to August 31, 1975. Reports on the occurrence of robberies were obtained from the offices of the district managers and checked against the records at the corporate headquarters.

There were significantly fewer robberies in the experimental stores than in the control stores.

During the experimental period, there were a total of 97 robberies for both groups of stores. The control stores experienced 57 robberies, the experimental stores 40. If the treatment had had no effect, then it would be expected that half the robberies would occur in each group, i.e., for any robbery the chances would be 50-50 whether it occurred in an experimental store or in a control store. The situation is analogous to flipping a

coin 97 times—how often, just by chance, would the coin come up with 57 heads and 40 tails? The answer is only two times out of one hundred.

Stated in formal statistical language, the binomial distribution was used to calculate the probability of the observed distribution of robberies between the experimental and control groups. The binomial distribution permits the calculation of the probability of an event occuring with a given distribution of occurrences when there are but two ways it can occur and the probabilities associated with either occurrence are known. The binomial theorem is used to calculate the probability of exactly k events in n occurrences:

$$p\,(k;\, n,p) = \binom{n}{k} p^k \; q^{n-k}$$

where $p\,(k;\, n,p)$ is the probability of this event occurring, p is the probability of an event on any given occurrence, and $q = 1-p$;. This is conceptually analogous to the determination of whether the robbery treatment had an effect. If it had no effect, the probability of a given robbery occurring in either the experimental or the control group is the same, $p = .50$. The probability of the observed event can be calculated using the number of robberies ($n=97$) and the number of robberies in the control group ($k=57$). Inserting these values in the above formula produces a probability of this event occurring of .02. This is considerably less than chance and indicates that more robberies in the control group were due to some systematic difference. Specifically, the experimental group experienced a smaller number of robberies than the control group at a statistically significant level.

The percentage decrease due to the prevention procedures can be calculated in two different ways. First, on the assumption that the occurrence of robbery in the control group would be the natural expectation for the experimental group if the prevention procedures had not reduced them, then the percentage reduction is 17 out of 57 robberies or 30%. On the other hand, 58.7% of the 97 robberies occurred in the control stores, while 41.2% occurred in the experimental stores for a difference or reduction of 17.5%. An analysis was done with the January results excluded. There were 8 experimental and 8 control store robberies in January, 1975. Therefore, the results analyzed for February through August, 1975, were even more significant and all of the statistical conclusions the same.

It was also expected that the robbery prevention procedures would reduce the average dollar loss per robbery because reduction of cash in the register was stressed during the training. However, no effect was found. As indicated in Table 7-4, there were only chance differences between the losses for the experimental and control stores.

No evaluation of the effects of the violence prevention procedures was possible. Very early in the study, it was realized that violence would occur so seldom that any analysis would be invalid unless many more stores were involved.

The experimental design permits a detailed examination of the effect of the robbery prevention procedures. Were the effects general or did the reduction of robberies occur for only particular kinds of stores? The decrease in robberies was related to the previous robbery experience of the

Table 7-4. Mean cash loss per robbery during the experimental period

Previous Robbery Experience	Safety Score	Cash Loss: Experimental Stores	Cash Loss: Control Stores	Total	Difference*
2+	1 low	172.00	220.75	392.75	- 48.75
2+	2	47.00	51.30	98.30	- 4.30
2+	3	29.05	79.74	108.79	- 60.69
2+	4 high	32.80	29.33	62.13	3.47
1	1	123.60	235.00	358.60	-111.40
1	2	145.00	136.60	281.60	8.40
1	3	115.50	105.67	221.17	9.83
1	4	**	72.67	72.67	---
0	1	60.50	70.97	131.47	- 10.47
0	2	208.40	89.33	297.73	119.07
0	3	64.50	**	64.50	---
0	4	107.33	59.00	166.33	48.33
Totals		1118.71	1069.41	2188.12	36.51***

*A negative difference favors the experimental group.

**Cell in which there were no robberies.

*** $\underline{t}$ (92) = 0.05, non significant.

experimental stores. As indicated in Table 7-5, there was little difference between experimental and control stores that had not had previous robberies; a slight but insignificant difference for stores with one previous robbery; but a significant difference for stores with two or more robberies. These results indicate that the prevention procedures were effective with stores that had previously been robbed frequently but not with others.

Table 7-6 presents the robbery experience of the experimental and control stores for those stores rated very safe (3 and 4) and therefore unattractive to robbers and those rated as more attractive. There was very little difference between the experimental/control robberies for the stores with high safety (3 and 4). For those stores that had been rated as unsafe, i.e., attractive to robbers (1 and 2), significant differences were found between the robbery experience of the experimental and control stores. These results indicate that the robbery prevention procedures were effective with stores that were vulnerable; that is, stores that had characteristics that made them attractive to robbers.

The results to this point show that the effects of the prevention procedures were not general. They did not reduce robberies across the board, but were more specific in reducing robberies for stores with a previous history of high robbery frequency and for stores that were rated as attractive to robbers.

This effect can be seen most clearly in Table 7-7 which presents the robbery frequency for each of the twelve cells in the experimental design. Previous robbery frequency and safety can thus be viewed in relation to each

Table 7-5. Experimental period robberies as related to previous robbery experience

Previous Robbery Frequency	Experimental Period Robberies		Total	Difference*	Probability**
	Experimental Stores	Control Stores			
0	12	14	26	- 2	.14
1	12	17	29	- 5	.10
2+	16	26	42	-10	.04
Overall	40	57	97	-17	.02

*A negative difference favors the experimental group.

**The probability (as computed by a binomial expansion) of the observed number of robberies occurring in the control group given the total number of robberies and the assumption of an equal probability of a robbery occurring in either group.

Table 7-6. Experimental period robberies as related to safety score

Safety Score	Experimental Period Robberies: Experimental Stores	Experimental Period Robberies: Control Stores	Total	Difference*	Probability**
1 low	10	21	31	-11	.02
2	12	21	33	- 9	.04
3	10	8	28	2	.17
4 high	8	7	15	1	.20
Overall	40	57	97	-17	.02

*A negative difference favors the experimental group.

**The probability (as computed by a binomial expansion) of the observed number of robberies occurring in the control given the total number of robberies and the assumption of an equal probability of a robbery occurring in either group.

Table 7-7. Experimental period robberies as related to both previous robbery frequency and safety score

Previous Robbery Frequency	Safety Score	Experimental Period Robberies		Total	Difference*	Probability**
		Experimental Stores	Control Stores			
2+	1 low	3	8	11	- 5	.08
2+	2	2	10	12	- 8	.02
2+	3	6	5	11	1	.23
2+	4 high	5	3	8	2	.22
1	1	5	6	11	- 1	.23
1	2	5	5	10	0	.25
1	3	2	3	5	- 1	.31
1	4	0	3	3	- 3	.12
0	1	2	7	9	- 5	.07
0	2	5	6	11	- 1	.23
0	3	2	0	2	2	.25
0	4	3	1	4	2	.25
Overall		40	57	97	17	.02

*A negative difference favors the experimental group.

**The probability (as computed by a binomial expansion) of the observed number of robberies occurring in the control group given the total number of robberies and the assumption of an equal probability of a robbery occurring in either group.

other and to the frequency of robbery during the experimental period. The difference between the experimental and control stores is greatest for those stores with the highest previous robbery frequency (2+), and for the greatest attractiveness of the stores for robbers (1 and 2). The difference between the experimental and control stores was 17 robberies overall. In the two cells identified as 2+ robberies and rated 1 and 2 on safety, the experimental stores experienced only 5 robberies, whereas the control stores had 18; therefore, 13 of the experimental stores advantage of 17 robberies are accounted for by these two cells alone. The probability that this could have occurred by chance is .006.

The robbery prevention procedures reduced robberies. However, they were not effective for stores that previously had not been robbed frequently, nor for stores that were already unattractive to robbers. They were effective for stores that were frequently robbed in the past and for those stores which were attractive as robbery targets and consequently could be helped the most by the prevention procedures.

The statistical analysis is unequivocal and conservative. Analysis of variance was not used, even though it is a more powerful statistical procedure, because of the nature of the robbery frequency data. While the F test is relatively robust with regard to moderate departures from either normality or homogeneity of variance within treatment groups, and data transformations are available which can bring even extreme data within an acceptable range, the robbery frequency data were quite extreme in both departure from normality and heterogeneity of variance. As noted previously,

146 of the population stores had 0 robberies and 39 of these stores had been robbed as many as 3 or more times; such data create a highly skewed distribution difficult to transform to normal. Further, there were 2 cells within the original design in which there were 0 robberies and 0 within-cell variation, as well as cells in which one store had been robbed 5 times, one store but once, and the remaining 3 stores 0 times; such high heterogeneity of variance is difficult to transform to acceptable ranges. Accordingly, analysis of variance was not the chosen statistical analysis of the robbery frequency data as the assumptions could not be met.

CHAPTER VIII. CONCLUSIONS

In a study of robbery of convenience food stores the attempt was made to test by scientific standards an alternative strategy of crime reduction—to dissuade the robber by making physical and behavioral changes at the target site.

The study tested the approach by gathering evidence that would support or refute each link in a chain of argument.

- If robbers exercise selection among targets, then robberies will not be distributed at random across similar stores—some stores will be robbed more frequently and some less frequently than others.

The results of the study clearly indicated that a few stores accounted for a disproportionate number of robberies. The results also indicated that the pattern was remarkably consistent extending for as long as two years, in that, a significant relationship was found between frequency of robbery in 1973 with frequency in 1975. The relationships were consistent but low and a large element of chance was involved. However, an analysis of this chance element by use of the Poisson distribution provided further support by indicating that more stores were never robbed, and more stores were frequently robbed than would be expected by chance. The results are very firm on this point, and it can be safely concluded that there is a non-chance patterning of robbery frequency occurrence among targets. There is definitely something to be explained, and some causal element that can account for these results needs to be

identified.

- There must be differences between frequently robbed and infrequently robbed stores that can be identified and reliably measured.

The evidence to support the identification of differences between frequently and infrequently robbed stores was definite. The overall rating of attractiveness to robbers was clearly significant although low. The sub-scales were not definitely rated to robbery frequency, suggesting that the raters may be responding to some global impression whose elements are unidentified, or to some specific but unknown variable not yet articulated. Secondary analysis may yet reveal a pattern among the sub-scales but that could not be accomplished under the present scope of work.

The attractiveness dimensions were reliably measured as determined by the agreement between independent raters.

- The characteristics which differentiate frequently robbed stores must be physical and behavioral factors specific to the site and not general features such as the socio-economic level of the store's surroundings.

If robbery frequency were largely determined by the character of the surrounding neighborhood, or by sales volume, then these causes could not be manipulated and therefore would not help robbery reduction. But that was not the case, neither of the factors was found to be related to frequency of robbery. The rating of attractiveness made in response to the specific physical and behavioral features at the site was related significantly. This point is further supported by the results of the field

experiment. When changes were made to lower the attractiveness of the sites, the frequency of robbery decreased.

- It must be possible to change the significant characteristics through training or physical alterations that are feasible within reasonable costs and business requirements.

The characteristics were changed primarily through training and inexpensive physical changes. Had it been feasible to make all the physical changes desired, the reduction in robberies might have been even greater. The requirements of the research were met within reasonable costs and business requirements. The feasibility of applying the procedures in non-research situations is discussed below.

- The reduction in robbery due to the training and physical changes must add to personal safety and cut losses enough to be worth the effort to implement them.

The 17% or 30% (depending on one's choice) reduction in robberies is substantial in view of the scarcity of prevention strategies. If a reduction anywhere near these figures could be obtained broadly enough it would have a significant impact on crime, deaths, and injuries.

However, costs are a serious barrier to the use of the procedures at their present stage of development as discussed further below.

- In order to warrant widespread adoption, the effects of the robbery prevention procedures should be long-range or semi-permanent and therefore cannot depend on secrecy or deception or be easily circumvented.

The decrease in robberies produced by the prevention procedures took place over an eight-month period, certainly, at least, middle-range if not long-range. Other strategies such as stake-outs, shot-gun squads

or highly publicized "crack-downs" usually have short-term effects of one or two months before rates climb back up. It is planned to continue to follow the experience of the stores in the experiment through the next year through the cooperation of Southland Corporation.

The procedures do not depend on secrecy or deception, in fact, the opposite is the case. It would be expected that the procedures would become even more effective, if more widely publicized.

It can be concluded that the evidence supports each link in the chain of argument. The results taken together indicate that a promising new alternative strategy for reducing armed robbery has been established. This strategy is a potentially effective means to significantly reduce crime.

Immediate and widespread application does not appear practical, however, both for reasons of cost and limitations on knowledge. The reduction in robberies was found to be effective with stores that had previously been robbed frequently and were most attractive to robbers, that is, had the most to gain from the prevention procedures. Other stores were not helped. At their present stage of development the procedures might be successfully applied in a business with adequate records to identify frequently robbed stores. This could reduce the costs of surveying the stores to determine those that are particularly attractive to robbers. Having identified in this way those stores most likely to benefit from the procedures, the sizeable costs of training store personnel and making physical changes might be warranted in special cases. It can not be expected that the saving from dollar losses would pay for the

implementation expenses. A very high value would have to be placed on increased personal safety.

Inexpensive methods to implement the prevention procedures are believed possible to develop but widespread attempts to use the techniques should wait for them to be developed and demonstrated.

One of the foremost barriers to successful implementation is the lack of knowledge about the effect of reduced money in the stores. The implementation was unsuccessful in reducing the average dollar loss per robbery. This may in part be due to the effectiveness of past campaigns which have given the Western Division, in which the study took place, the lowest cash loss rate in the corporation. However, there was still far more money kept on hand than the staff believed necessary. Unfortunately, this fact has not been demonstrated and the owners of small stores are resistent to changing their cash handling practices. What is needed is a clear demonstration of the minimum cash needed under different store operating conditions. It should be possible to significantly reduce the dollar loss from robbery if this were done.

The effect of reduced cash on robbery frequency is not known for small retail stores. The assumption that reduced cash will eventually decrease the rate of robbery is widespread, but whether or not it is true for small retail stores has not been adequately studied. This assumption should be rigorously tested by research.

END

7 tables/summary