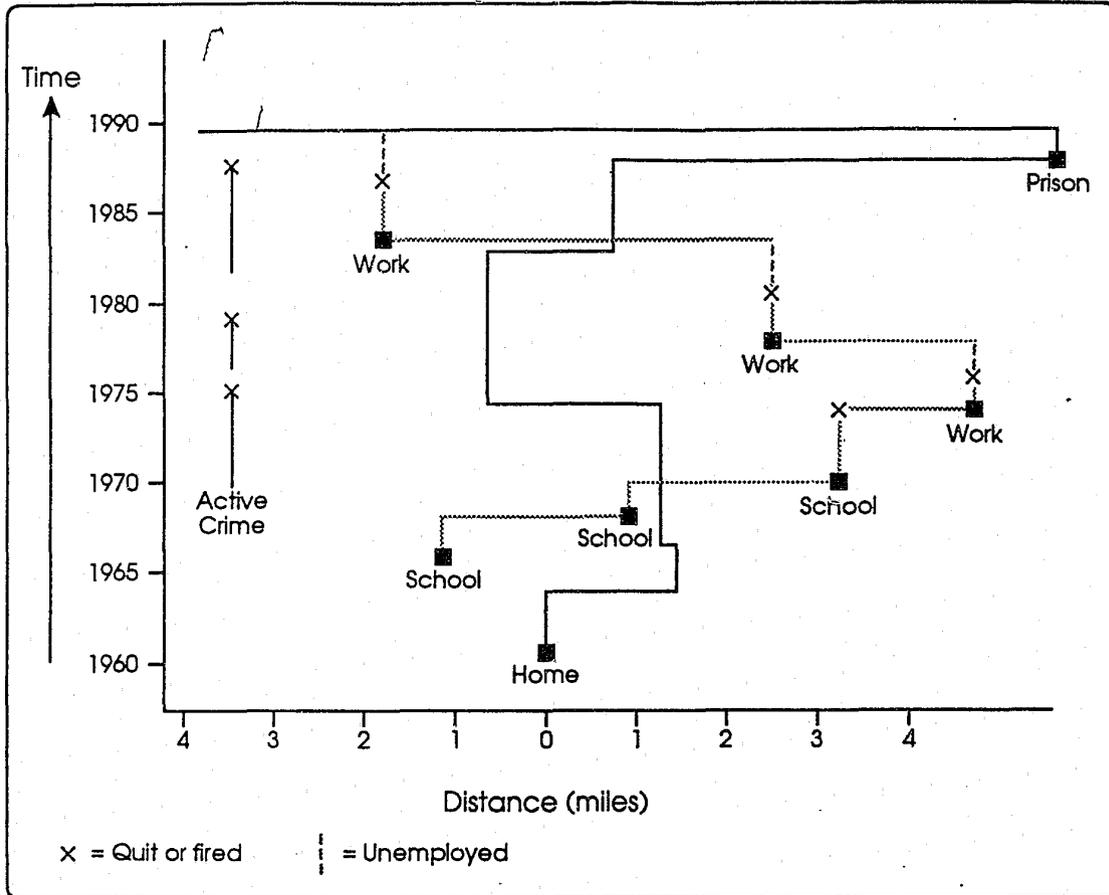


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Space, Time, and Crime:

Ethnographic Insights into Residential Burglary



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FINAL REPORT

SPACE, TIME AND CRIME:
Ethnographic Insights into Residential Burglary

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One of the most difficult tasks in field work is to make those first steps, to meet and gain the confidence of those individuals with the background and ability to teach us what we need to know.

During the course of this research we have met and become friends with many people with whom we share very little. Their morals and conduct, both past and present, sharply differ with ours. They had much to lose through their association with us, and little to gain. Yet they willingly accepted us, and gave freely of their knowledge. They were good teachers, and we learned a great deal about ourselves, as well as about burglary.

They are responsible for what ever success we have achieved. We owe each of them our thanks.

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Introduction

There are few studies of crime that attempt to understand the criminal's activities from the criminal's point of view. There can be no more critical element in understanding and ultimately preventing crime than understanding the criminal's perceptions of the opportunities and risks associated with these activities. Rarer yet are studies that attempt to integrate qualitative information about criminal's activities with a theoretical basis. The present study classifies property criminals' perceptions into spatial and temporal components that combine to form their routine activities (Cohen and Felson, 1979).

These topics have been explored previously with varying degrees of success using aggregate data (Figlio, Hakim, and Rengert, 1986). But aggregate data does not directly identify the subjective perceptions of property criminals. To begin to understand the rationality and decision making of these criminals and fit it into the context of their daily lives (and not the context of the researcher's) requires a somewhat different approach.

For this study of residential burglars, we have chosen to use many of the techniques of ethnography. An ethnographic approach seemed to be the best way to divorce our preconceived notions of criminal behavior from the rationality and decision making of these criminals (Cornish and Clark, 1986).

The Ethnographic Approach

We borrowed the techniques of ethnography to gain first-hand, direct information from a group of informants who all shared the common attribute of practicing

residential burglary. Gathering detailed information from a few informants was chosen rather than gathering less detailed survey information on a cross section of subjects.

There are strengths and weaknesses of each approach. The cross section survey is more likely to be representative of the general population, and it relies heavily on the researcher to identify the research questions before the survey is constructed. Ethnography is less structured than survey research and allows the researcher to identify important issues and problems as the study progresses. Because it is open ended, ethnographic techniques allow the researcher to gather information from the informant by observation as well as conversation. It also allows the researcher in the field to pursue an area of interest in a variety of ways, and verify information over a series of interactions with the informant. In many ways ethnography is the process of asking questions in order to learn what questions to ask.

In the present study, we decided to stratify our subjects in order to obtain information from a variety of environments. Our research plan was to identify five informants from a large inner city (Philadelphia), five informants from a mid-sized city (Wilmington, Delaware), and five informants from the suburban areas between these two cities. While representing different and contrasting environments, the study was contained in an easily manageable region. Philadelphia and Wilmington are only 32 miles apart.

In order to meet our objective of five individuals from each area, we had to invest a considerable amount of time working with many potential informants in order to arrive at fifteen. Many potential informants were difficult to work with, others proved unreliable and had to be dropped.

from the study, while others decided the researchers were not to their liking and became impossible to reach. Several were difficult to reach because they could not make bail. There were also several who were consciously avoided because they were too unstable to provide consistent data. All of these efforts were part of the process of asking questions until we learned the right questions to ask. The end result was information from fifteen individuals with significant burglary careers, five from each area.

Our initial contacts with informants came from a variety of sources. In Philadelphia and Wilmington we were able to start in the probation departments and work out into the community. We also had several contacts from a previous study conducted among convicted burglars in suburban Philadelphia, and some local contacts from years of living in Philadelphia and Delaware County.

First sessions with these contacts started out as structured interviews and digressed to general conversation. This gave us the opportunity to gather some basic demographic information while getting a general feel for the individual. As part of this process, we asked the informant to complete a task that involved viewing photographs of houses and evaluating the house as a burglary site. This allowed us to learn more about the burglar as they commented, sometimes at length about a house and its attributes. Their comments became a rich source of information to follow up in later conversations. It also revealed that some of the people were really not residential burglars, or were unwilling or unable to tell us much.

The comments about the photographs led to general conversation, and in most cases a certain rapport. If the informant seemed willing and able, we arranged to get together again, to "spend some time" with the informant and

learn a little more. The initial meeting usually lasted between one and a half and three hours, and was conducted in neutral territory, a fast food restaurant or bar.

At our second meeting, we would talk about the techniques of burglary -- how one would choose a house, break-in, and what one would look for in the house. This all, of course, took place during the course of a broad ranging conversation. As the conversation continued we learned about the burglar's family, their problems, their interests, the problems they had with their car, their criminal record. And we began to reveal some of ourselves.

As we established a rapport with these individuals we moved from neutral territory to their neighborhood. Often our second, and always our third session was conducted in their neighborhood, and often in their home. This was our first opportunity to really begin to measure the informant as a whole person, within the context of his own environment. And often we found ourselves sharing many of the informants concerns about things as far removed from burglary as race relations, the economy and how to get along with one's female companion.

By the third session, if the informant was still a viable participant, we tried to move the conversation, and the time we spent together into the field. We asked the burglar to go for a drive with us and show us how they would go about selecting a site and executing a burglary. The researcher drove while the informant did the "play by play."

The informant was asked to not reveal anything that could be used against him, like a burglary that he had not been arrested for. This was our attempt to give the informant equal control over the information about their burglary careers that formed the common ground of our

initial relationship. Little did we realize that this would lead, in many cases, to lengthy, step by step descriptions of how a house was selected, attacked and successfully burglarized. Often these descriptions were given while we were sitting in a car in front of the house.

These tours also elicited comments from the informant about "checking out" a specific site in the future. This was information we reminded the informant, we did not want to know. Our explanation was purely pragmatic rather than ethical. "If any one ever asks, I don't know."

Spending time with the informant in these "ride along" sessions became a valuable way to gather information not only about burglary but also about the informant. As time progressed it became easy through conversation to learn more about the informant and to confirm earlier comments about other aspects of their lives in which we had an interest, such as time use.

Each informant was asked to construct time diaries noting the time they awoke, and what time they performed different activities for the following day. After the "next day" diary was kept, the informant was asked if they would do a similar diary for a future time that included a burglary, if no crime had been committed on the "next day" diary. If they were not working, we also asked for a reconstruction of what their day was like when they were last employed.

In addition to asking the informant to actually construct time diaries, we were able to learn in a completely different context about the informant's use of time. The answer to a simple question like "What have you been up to?" usually brought a wealth of information about the current events in the informants life. All of which were

compared and contrasted to their more formal descriptions. Its hard to misrepresent yourself or give the answers you think are wanted over time, and over several pitchers of beer.

This research method is very time consuming, and can be very taxing physically and mentally. We averaged twenty four hours with each of the subjects we used, and many additional hours with subjects that we were not able to use. We were spending time with informants up to the time the first draft of this final report was written.

Sampling

For many of our subjects, we started in probation departments with individuals under supervision and used "snowball" sampling to reach active burglars in the community through them. This snowball sampling technique has advantages and disadvantages. The greatest advantage was that it led us to informants outside the usual criminal justice system channels. The disadvantage is that these individuals were often very much like the individual who led us to them. For example, a drug addicted property criminal is more likely to know other drug addicted property criminals, than those who are not addicted.

In retrospect, we attribute the fact that we met only one drug addicted burglar from Wilmington, although well over half of the burglars from the other areas had substance abuse problems, to snowball sampling. We started with older, non addicted property criminals in Wilmington who introduced us to their peers who had similar attributes.

In many other ways, snowball sampling is a self selecting process. All of the informants that are represented in this report responded to the researchers as

people, and the researchers to the informant. Potential informants who didn't like our looks, were suspicious of our motives or who didn't share enough interests to keep a conversation going did not participate long enough for us to get sufficient data. In this way the field worker becomes an important bias in the snowball sampling process.

We may have lost a degree of representativeness because of snowball sampling. Yet, illustrated below, we gathered information from many diverse individuals. With several informants from each of several residential areas we feel we have sufficient information to draw conclusions about both the general conduct of burglary, and how the highly personal aspects of time use and spatial knowledge interact to help form individual decisions.

About the informants

The brief description of each informant which follows is designed to give the reader basic information with which to identify each informant in the analysis that follows. In this report each informant is assigned an identifying letter. We assigned a letter to each subject in the order in which they became involved in our study. Not all letters are used because individuals which were dropped from the study for various reasons kept their letter identification.

Philadelphia Burglars

Burglar E is from the West Philly - Overbrook section of Philadelphia. He has always lived in the area, and many of the members of his extended family live within several blocks. He is 21 years old, black, and intermittently employed as a cook. He is a frequent user of cocaine and has been treated for abuse of this substance. His family is very close knit and supportive. He only has one criminal offense

on his record, and has never spent a day in jail or detention. His girl friend was pregnant during our work with him. He commits burglaries both on foot and with an automobile depending on the circumstances. He exploits the same area without regard to transportation. He was much more open and outgoing away from his own neighborhood. Within his neighborhood, he was afraid that if he was seen with a couple of white guys, his friends would think he was "slittin' on them," as in slitting throats.

Burglar M is from the Germantown section of Philadelphia. He was born in the black ghetto of north Philadelphia, but moved to Germantown as a youth. He is 21 years old, and lives with his mother and older brother. His mother is very supportive of him. He has worked as an auto detailer and a mover. He is very athletic and attractive. He uses cocaine but claims not to be "a fool" or addict. When he commits a burglary, he is on foot or a bicycle. He started his career of crime in high school with a group of friends.

Burglar C is from the part of Philadelphia made famous by Rocky Balboa. He was born and raised in this tough, ethnic blue collar area. He is white, and 22 years old, and during the time we knew him lived with his mother later moving out on his own again. He seemed intelligent, but as we discovered during our conversations, functionally illiterate. He quit going to school long before he could legally drop out and has worked as a plasterer and drywaller. He seemed to know everybody in his neighborhood, and committed all his burglaries in nearby areas that were slightly better off economically than his home turf, but still firmly in the working class category. He walks to his crime sites unless they are some distance away. He had only recently discovered the more prosperous neighborhoods of the nearby Northeast section of Philadelphia through his

relationship with a girl friend. Burglar C would not be classified as a substance abuser, but will be soon if he keeps drinking heavily.

Burglar G was born and raised in the heart of North Philadelphia's ghetto. He is a 27 year old black man who lives with his father intermittently when not staying with a girl friend. He has worked as a carpenter, mover and factory worker. He commits burglaries that involved planning and burglaries that are crimes of opportunity. His extended search crimes involved the use of a car and accomplices "my boys." His crimes of opportunity were committed on foot and often resulted in chases and arrest. They were often also close to home. He became involved in crime in junior high school and left school in the eleventh grade.

Burglar Y was born and raised in the Southwest section of Philadelphia. He is 37 years old. He is a small wiry black man who has suffered through years of heroin abuse. He has been employed in as a presser, a warehouseman, and a parking lot attendant. He is a high school graduate. His criminal career is lengthy, and began while he was on his first job. He has served two long sentences in Pennsylvania prisons. He walks to his crime sites on his way to drug deals. Due to his drug dependency, he uses every means possible to locate crime sites.

Suburban Burglars

Burglar B was born and raised in Delaware County, Pennsylvania. He is 22 years old, and is a small slender man with shoulder length blond hair. He has worked in building trades and as a groom at the race track. His burglary career is completely suburban and includes service stations as well as residences. He began his burglary career at 15. After quitting school in tenth grade and leaving his family home,

he moved in with an older woman who held a low level management position with a financial services company. He met her through his use of cocaine. Substance abuse especially cocaine, has been closely tied to all of his criminal problems. During the height of his cocaine habit when he was using "insane amounts" he drove directly to Philadelphia to buy it. He always uses a car to commit burglaries. He has served time in both juvenile and adult facilities.

Burglar D was born and raised in New Jersey and lives in New Castle County. He is a 27 year old white man who lives with three other men. He has worked in construction sporadically. He graduated from high school. He is a suburban burglar who has very definite opinions about class and values. He specializes in upper middle class neighborhoods such as the one he is from, rather than the truly rich, because he feels the risk among the truly rich is far greater while the rewards are not. He has equally lengthy and articulate opinions about architecture, landscaping and the time use of suburban residents. He is unmarried and works only occasionally through a temporary agency when the work suits him. He is a drug abuser.

Burglar T was born and raised in New Castle County, Delaware. He is a 23 year old white man who began to use drugs at 10 or 11 years of age and has had a constant involvement with both drugs and crime. He began his burglary career at about 15 years of age. He already has 28 felonies on his adult record and 6 as a juvenile. As he pointed out, "those are only the ones they know about." At the relatively young age of 23, he has already spent over two years in an adult correctional facility. He is a suburban burglar who drives to his crime sites and works mostly on weekends, always with accomplices and whose behavior is tied in to the drug he is abusing.

Burglar A was born and raised in New Castle County, Delaware. He is 26 years old, white, lives with his girl friend, and has an extensive career as a burglar. He has worked as a grocery clerk, bar tender, roofer, and construction worker among other jobs. He started burglarizing homes while in high school, before he dropped out. He claims that he does not have a drug problem so much as a "high living" problem. He uses burglary as an easy way to acquire many of the things he wants. He and his accomplice explored the suburbs extensively, drinking beer as they drove around. Often a little to woozy to actually burglarize a house, they maintained an inventory of houses that they monitored on an ongoing basis. This burglar easily pointed out the residences of the Mayor of Wilmington, a prominent judge and a Delaware State Senator.

Burglar Z was born in Maryland and grew up in northern Delaware. He lives in New Castle County. He is a 25 year old white man who has worked as a roofer. He was kicked out of school for fighting at 16 and left home shortly after that. He has lived "here to there, here to there." He is proud of the fact that one of his crime sprees made the front page of his local paper.

Wilmington Burglars

Burglar R was born and raised in Wilmington. He is a 23 year old black man from a stable middle class Wilmington family. He was kicked out of school in the eighth grade for fighting and never went back. He has worked in a mattress factory, on a trash truck and as a technician among other jobs. He does not use drugs. As a juvenile he began his criminal career with petty theft from local stores and stealing from unlocked cars. He left his parents home at 16 and lived with friends, relatives and on the street. He has

a young child who he visits regularly. Supporting his child, along with his current life style is a major motivation for his burglary activity. He is exclusively an urban burglar and never uses a car.

Burglar K was born in Delaware and raised in Wilmington. He is a 21 year old white man who has worked as a truck driver, sales clerk and mechanic. He was introduced to burglary by his foster father at 15. His overweight and out of shape foster father used the thin and athletic teenager to enter houses and stores that he had selected and often watched for several days. When his foster father was caught Burglar K spent time in a juvenile facility and has been on his own since. His burglaries are all in urban areas, and most often in low rise apartment buildings. He uses a car in his burglaries. He is married but separated and has a daughter. He frequently works and uses burglary to maintain a higher income level.

Burglar P was born in Delaware, raised in southern New Jersey and returned to Wilmington for high school. He is a 22 year old white man, and primarily an urban burglar. Taking us at our word, he practically reenacted in great detail the two burglaries that were on his record. When we met him he was under supervision and working hard to "please the system," because he wanted permission to move out of the state. He was a rich source of information, but always with the reminder that it was "just talk."

Burglar V was born and raised in various towns in Pennsylvania. He last lived in Wilmington Delaware. He is a white man in his mid thirties. He is divorced and has a daughter. He is about to remarry. He has gone from rags to riches several times since coming out of the army at 22 with

his criminal career responsible for both outcomes. He showed us sites that we were able to verify through incident reports as well as sites that were being "researched." Unfortunately we completed our conversations in a Pennsylvania prison visiting area. An old "junk" charge had caught up with him. During the course of his stay in prison he demonstrated that he was a formidable legal opponent, using every ploy imaginable to reduce bail, reduce charges and delay trial.

Burglar L was born in New Jersey and has moved around a lot when living with his family. He now lives in Wilmington. He is a 22 year old white man. He ran away from home at sixteen and became involved in burglary as a means of support. He has worked in construction and tv repair. He became involved with cocaine at 18. According to him, his cocaine use was a by product of all the money he had at his disposal. He was also working at this time. He was the only burglar in the sample who discussed assaulting a resident or neighbor during a burglary. He was primarily an urban burglar who both walked and used a car. He also committed occasional burglaries at vacation resorts while on vacation.

These are the individuals who taught us about burglary for the past year. We found them to be very insightful individuals whose common sense is often overlooked by those outside the criminal world. In the following chapters, we attempt to apply some of these common sense notions to generally accepted academic models in order to better understand the process that is residential burglary.

Spatial Aspects of Residential Burglary

Residential burglary is an example of a decision-making process that may utilize many distinct channels of information. In some cases, a considerable amount of energy may be expended in obtaining spatial and temporal information used in the burglary process. In other cases, very little effort may be expended and this information may be considered a windfall. In the beginning of this chapter, we focus on the manner in which individual burglars collect spatial and temporal information for use in residential burglary. How the source of information effects the location of a burglary site is of special interest. In the concluding section of this chapter, we analyze the spatial patterning of burglary sites which result from these information sources.

The Similarity Between Residential Burglary and the Real Estate Enterprise

The process of searching for a burglary site has properties in common with the spatial search process involved in the real estate market. That is to say that residential burglars have much in common with residential home buyers and renters who are searching for new homes. Each group evaluates homes for their specific purposes and needs. Corollary information sources can be identified for residential burglars and home buyers or renters. Home buyers

or renters and burglars both often rely on specialists to help them. Home buyers and renters use real estate agents who make a profit by finding a home for a prospective buyer or renter. Burglars may rely on fences who also make a profit by providing information about residences that are not occupied at specific times of the day or week, or that contain especially valuable items.

Both home buyers or renters and burglars take advantage of public sources of information about residences and the community in general. Newspapers are a valuable source of information for both groups. Home buyers and renters look in the classified section for listings of available homes. Some residential burglars look in the obituary section for dates of funerals and the addresses of the deceased and close relatives to identify a time and a place where a residence will not be occupied. Weddings offer similar opportunities if they are announced in advance, or generally known in the neighborhood. Burglars also check the social section of smaller weekly papers where many people publish plans for vacations or visits with relatives.

These are the most formal sources of information for both the home buyer or renter, and for the residential burglar. Less formal sources of information are more often used by low-income home buyers and renters, and can be a valuable channel of information for residential burglars.

One important source of information is an individual's social network of friends, family, coworkers and other personal contacts. This source is especially important for co-offending residential burglars. It is common for a burglar to meet friends and ask them if they "know of anything". This kind of information may reduce the risk and increase the probability of financial gain. The information may be just a suggestion of something a co-offender "heard on the street". The information is especially valuable to a residential burglar if it is first hand information from a person who has observed a prospective residence as an employee, sales person, or utility worker.

Social networks also provide background information that may guide individual home buyers, renters and burglars in a more general way. Sharing information about places to shop, recreational areas, and neighborhoods new to the burglar or home buyer may expand the area of their search by expanding their knowledge of the region. As we will see later, being invited to a social event as a guest is an important way of learning about new areas for burglars.

Friends, family and coworkers can not supply all the information required by an active residential burglar. The burglar only knows a few maids, gardeners, or other laborers who can supply this information. The potential of these homes is quickly exhausted by an active burglar, and he or

she must rely on a final informal source considered here -- spatial search.

The real estate industry places "for sale" signs on lawns and "open house" signs are posted at important traffic intersections to attract prospective customers as they travel past. Residential burglars also drive or walk around residential communities looking for signs; but the signs that attract their interest are of another sort. Burglars look for signs that a home is not occupied at a specific time.

There is an extensive literature on the signs of crime (Powis, 1977). In this discussion, we will only mention a few signs pointed out to us by the residential burglars we interviewed that are examples of signs which are not often mentioned elsewhere in the literature. Burglar A pointed out an expensive mobile home/camper parked in a driveway. He said that he would take note of it and follow up as he passed through the neighborhood. If the mobile home is not there at a later date, especially on a weekend or holiday, he would interpret this as a sign that the family was away. The expense of the camper is a sure sign of wealth, and a willingness to spend that wealth on material things, according to Burglar A. An expensive camper in a conspicuous driveway is for the burglar the equivalent of a "for sale" sign conspicuously placed on a lawn to a home buyer. At a

later date, the absence of this camper is equivalent to an "open house" announcement.

Winter snow falls provide burglars with several signs for burglary. For one burglar snowfall made committing burglary "mandatory. After a heavy snowfall, while the snow is still on the ground, is a good time to look for houses." Signs of importance are side walks that are not shoveled after a day or two, the absence of automobile tracks in the unshoveled drive and an absence of tracks to and from the house. These signs are obvious. A less obvious, but very useful sign are tracks to and from a neighbors house. If these are the only tracks, it is an indication that the home is not occupied and also an indication of who has been asked to collect the mail and perform other chores. This sign provides the burglar important information concerning how to approach the house. The entry point should never be in the line of sight of this neighbor's house.

An active burglar makes a mental note of many such signs for crime during a spatial search for a crime site. The objective of the spatial search is to locate the best possible prospective burglary site, or sites if more than one burglary is to be performed.

There are other sources of information used in the real estate market and in residential burglary. In burglary,

information obtained while performing a legitimate job is especially important. Typical of occupations that provide burglars with first hand information about a house and its occupants are house cleaning, roofing, house painting, and landscaping.

Social occasions are an important means of learning about new areas. Burglars obtain information about specific houses and are introduced to new communities while attending parties and social gatherings as guests. Several burglars (A,D,K,C) we spoke to attended parties in areas they knew little about only to return later to burglarize the house where they had been a guest. In every case, the function had been held at the friend of a friend's house so that there was a certain social distance, as well as spatial distance between the burglar and the victim. Returning to the home of a coworker he had cased at an after work party, Burglar A committed one of his most profitable burglaries. He continued to explore the area and commit burglaries there following this success. Burglar A grew up in New Castle County and knew about the area, but had never known anyone from, or spent any time in this very affluent neighborhood. He learned quickly. Similarly, Burglar C learned of a new neighborhood when invited to a Christmas open house. A former neighbor who had grown up in the neighborhood with Burglar C had "made good" and moved out of their blue collar row home area to a more prosperous middle class section of

Philadelphia. Burglar C, along with many other former neighbors, attend the open house every year. It also gave our burglar an opportunity to become familiar with a new area that he soon began to exploit.

Home buyers and renters also learn of new communities through social functions. In fact, the sales techniques of an "open house" is designed to appear somewhat like a social function with home baked cookies and punch. The similarities between the real estate enterprise and residential burglary means that the real estate literature may provide useful models for the analysis of residential burglary. In what follows, we examine several aspects of the real estate market place to determine which aspects are useful for our purposes. We begin with the real estate search process.

The Real Estate Search Process

It is apparent that residential burglars have much in common with residential home buyers and renters who are searching for new homes. Therefore, analytical techniques used in real estate analysis may be useful for analyzing characteristics of residential burglars. A brief review of housing market studies will provide a conceptual base for interpreting information sources and the quality of the information used in the residential search process of burglars. Many of these studies attempt to evaluate the

extent to which people use various channels of information in their residential search process. Clark and Smith (1979) evaluated many of these studies in order to determine the relative and absolute use of a number of information channels. Table 1, adopted from their study, summarizes these findings in terms of the percentage use of various channels by individuals.

These studies are quite general in their focus. Most assume that people are relatively homogeneous in terms of their use of channels of information. Furthermore, there have been few attempts to characterize the nature of information channels and ways in which each might bias the spatial search process. Palm (1976 a & b) investigated the ways in which real estate agents might influence the use of information by individuals, and Smith (1980) found that real estate agents could affect the vacancy purchased by modifying the sequence of vacancies shown. From an ethnographic perspective, it is critical that we also recognize differences between individuals in their channel use and decision-making processes.

Talarchek (1982) identified differences among individuals in their selection of information sources. He isolated broad categories of individuals with respect to their selective use of information sources. First, he observed that a minority of intra-urban residential

TABLE 1: Information Sources Used in Housing Choice

Source Type (percentage using each type)

Citation	Real Estate	News-paper	Friend/Contact	Spatial search	Other
Rossi (1955)	11	15	38	15	20
Hempel (1970)	38	25	12	6	1
Barrett (1973)	24	15	21	25	15
Herbert (1973)	18	18	36	11	17
Speare (1975)	5	17	19	32	27
Michelson (1977)	25	26	15	28	6
Goodman (1978)	21	16	22	--	41

immigrants do not conduct a true residential search. Instead, they locate an acceptable residence based on privileged information from friends, relatives or coworkers. This group could be as large as one-third of all intra-urban movers. Talarchek found that they are most likely to be from lower socioeconomic classes.

There is considerable diversity within the low-income sector of the real estate market. Although their pattern of information sources is less structured than the pattern for higher income groups, it does not indicate chaotic individual search patterns. In fact, the diversity may be indicative of great creativity and adjustment to social constraints on the part of low-income residential decision makers (Talarchek, 1982, p. 52).

High-income persons and home buyers enjoy greater choice of residential type and use more formal information sources such as real estate agents. Again, there is considerable diversity within this group. Behavioral patterns of residential search are highly individualistic. They are a function of a decision maker's life history and immediate influences.

The case of residential burglars

Table 2 indicates the proportion of the residential burglars we interviewed who used each information source. Most of the burglars used a combination of information sources throughout their burglary careers. We indicate which sources were used by burglars operating in a large urban area, a middle sized urban area and a suburban setting.

Note that spatial search dominates all other channels of information used by the burglars we interviewed. This is certainly because almost all our burglars are quite active or have been quite active in the recent past. Other informal and formal sources of information can not be depended on to supply information on several houses a week. Active burglars increasingly must rely on the spatial search process to locate crime sites on a consistent basis.

This is not to say that the spatial search process is the preferred source of information. Our burglars much prefer to use inside information when it is available. The only concern expressed about the use of inside information was the risk of being "ratted out" or "slit" by the person who supplied the information.

Less active burglars may even rely on inside or informal sources of information. These less active burglars

TABLE 2: Information Sources Used in Burglary

Source Type (percentage of burglars who use each type)

	Fence	News- papers	Friend/ contact	Job	Spatial search	N
Urban Burglars		20%	100%	100%	100%	5
Wilmington Burglars	20%		40%	40%	100%	5
Suburban Burglars	40%	20%	80%	20%	100%	5

may be the most professional who are very selective and only burglarize targets they know contain valuables of great worth. They often rely on inside tips rather than search space to locate targets for a burglary. Less active burglars may also represent the less professional burglars who only dabble in burglary when they have the luxury of important information. The burglar who has chosen burglary as a part of his lifestyle and does not rely on inside tips exclusively must be active, and must search space for most of his information.

We note some interesting spatial differences in the location of burglary sites where information is obtained from various sources and where space is searched for this information. The exact location of a burglary site was not always available when a burglar identified an information source. When locational information was available, it is obvious that spatial search led to a much shorter distance travelled than when more formal sources of information are used. This finding is consistent with our earlier work (Rengert and Wasilchick, 1985).

The neighborhoods chosen as part of a spatial search tend to be those adjoining or nearby the burglar's own neighborhood, while secondary sources of information often led the burglar a considerable distance away. Therefore, we can expect sites located by spatial search to be clustered

about a routine activity node or anchor point such as home. Locations identified by secondary sources we can expect to be more randomly scattered about the region, and more isolated.

A burglar, K, who explored the more affluent areas of Wilmington such as Wawaset Park and Rockford Park also told us of two burglaries in Claymont. He had worked in one of the houses in Claymont as a house painter and used the occasion to "scope out" information about both his client and the client's neighbor. While most of his burglary sites clustered in Wilmington and nearby areas of New Castle County, the two Claymont sites stand alone and far removed from the areas he actively searches. Burglar M, active in the northwestern Philadelphia area discussed a very lucrative burglary he and his friend committed using inside information. While he knew the name of the suburban location of the house, he could recall little more. "My friend hooked it up. He knew all about the place up front. He knew where to go, and where everything was. I was just along for the ride."

Police efforts must be focused on different aspects of the burglary to suppress the more focused crime that results from spatial search than the more scattered sites that result from the use of more formal sources of information. In the latter cases, police may identify the information

sources which could lead to an arrest. Victims may be questioned as to whether they had had any outside contractors work on or in their homes recently, or who might have known that their homes contained valuables. However, most burglaries result from the spatial search of space and tend to be more clustered in space. Here, the location and characteristics of the community hold clues as to who is likely to exploit the area. Therefore, the characteristics of spatial search processes hold potential value for identifying practical solutions to crime. Spatial search to locate a crime site is the most often used information source. We examine this process in more detail in the following sections.

Spatial search strategies

Several aspects of the spatial search process offer interesting insights to professionals engaged in investigating the process of burglary. We will focus on two of these: stopping rules to identify when a site has been subjectively chosen; and, the spatial pattern of burglaries that many repeated search processes creates.

Stopping rules

The analysis of decision making in the real estate market place again provides us with a useful heuristic for interpreting the burglary search process. Brown and Moore (1970a) discuss a schematic model of intra-urban migration that has properties relevant to our examination of residential burglary. They postulate that a household evaluates the satisfactoriness of vacancies with respect to many attributes. These attributes are aggregated into an "aspiration region" bounded by the upper and lower limits of the values of each attribute considered satisfactory by the moving household. A specific vacancy may then be considered acceptable if its characteristics all lie within the household's aspiration region (Flowerdew, 1976).

Residential burglars who search space to locate a prospective burglary site can also be said to have in mind

attributes of a satisfactory burglary site. These attributes range from broad generalizations to very specific attributes. The aspiration region for broader attributes include the "look and feel" of an area.

The comments of Burglar D articulate the aspiration region around this attribute. He rejects the possibility of burglarizing houses in a nearby area calling them "Hockessen houses," referring to an area of New Castle County well known for its affluence. "Those houses look like Hockessen houses. They're too good. Probably have alarms, or servants. And they're rich and probably watch out for each other all the time." The same burglar also rejected everything that looked like a row home, including newly constructed, expensive town houses being built in the New Castle County area. "No way," he said, "I'll just stick to houses in middle class and upper middle class neighborhoods. I know what I'm doing there." It should come as no surprise that Burglar D came from a middle class area that fits well into his aspiration zone. Row homes were the exclusive target of a Wilmington burglar, who walked past twin homes in a prosperous neighborhood to burglarize town houses that were built in rows. For Burglar R, twin and single homes did not fit his aspiration zone concerning what a potential burglary site looked like.

More specific attributes concern the more mechanical aspects of burglary, and go far beyond whether a house is currently occupied or not. They also include whether the house is thought to contain valuables, ease of approach and entry, knowledge of the interior layout of the house, as well as other perceived characteristics of the site. Many times these attributes are interpreted in an individual fashion. Privacy fences are a good illustration of this. Suburban burglars feel fences are either a positive attribute because they provide cover, or feel they are negative attributes because they block potential escape routes. Burglar D found fences a positive attribute in evaluating the house next to the fence, because the fence blocked the neighbor's line of sight. A particular site may be discounted if any one of these attributes lies outside the burglar's current aspiration region or zone. In seeking a site that has the attributes that fit their aspiration region, burglars like home buyers are looking for a house that is "just right."

Aspirations may change during the search process. Locating a particularly appealing site early on in the search process may raise the standards by which subsequent houses are evaluated. On the other hand, if no particularly appealing sites are identified during a search process, aspiration levels may be lowered in order to identify a prospective site on that outing. Much depends on the amount

Potential areas of street dealing may be more limited than previously imagined. Research does not exist to identify its extent; but it certainly is not ubiquitous. Therefore, working from the center out with sufficient police presence may be necessary if we are to truly attack the problem of street drug sales. One thing is clear from the present research finding, it is not likely to remain contained as long as street and property crime serves as an effective vanguard for its spatial expansion.

Special efforts should be placed on removing drug sellers from their most lucrative locations. Marketing geography has established that these locations are along major routes which supply easy access to customers. If drug sellers can be moved onto less trafficked side streets they will be less accessible to the general user and there is a greater probability of obtaining community cooperation in removing sellers from more stable residential communities. Major traffic arteries are more likely to contain stores which close at 3 or 5 o'clock leaving the area unattended at night. Local residents on major arteries are more likely to be passive renters rather than more stable home owners who have a stake in their community. Although it may sound counter-intuitive, we may make more headway against street sales if they are moved off major traffic arteries where they are less noxious to local residents, onto more stable residential areas where police are more likely to encounter

of time remaining before the prospective burglars feel they must commit to a site, or retire empty handed. Therefore, the amount of time spent in a specific search may be considered a measure of the cost or effort expended in the search process. The question is whether generalizable rules can be identified which govern when the burglar is likely to stop the search process and settle on a specific site.

Economists, geographers and operations researchers have identified several models of optimal stopping rules which will be considered here (Chow, Robbins and Siegmund, 1971; DeGroot, 1970; Silk, 1971; Schneider (1972). Although highly simplified, these models provide interesting standards against which the real-world search behavior of burglars can be contrasted. Rapoport and Tversky (1970, p. 118) justify such contrasts,

"man is viewed as an intuitive statistician who acts in order to maximize some specified criteria while operating on the basis of probabilistic information. The results of statistical decision theory, which are applicable to such problems are, then, used as a baseline for evaluating his performance. The success of the above approach depends not so much on the degree to which human choices are optimal, but rather on the degree to which choice behavior can be properly

characterized in terms of the pattern of departure from an optimal model" (quoted in Flowerdew, 1976, p.48)

The intent of this section is to evaluate several stopping rules in terms of whether they adequately describe the behavior of the residential burglars interviewed in this study.

Stopping-Rule Models

A stopping-rule is one in which a decision must be made on the basis of a set of observations, which are evaluated sequentially (Flowerdew, 1976). It is a rule on the basis of which a decision must be made to terminate a search and make a choice. As each observation is considered, the burglar can choose whether to continue the search process or to stop and burglarize the present site. This decision is made by comparing the attributes of the site with the current aspiration level of the burglar. Each attribute has a fixed utility for the burglar while continuing the search has a cost in terms of time and effort.

The burglar also has some notion of the range of utilities of sites he has not yet considered, a notion which may or may not be accurate. We assume that these utilities have a known probability distribution. Therefore, the

attributes of each site considered by the burglar represents an independent sample from this distribution. We may also assume that the utility of each dwelling can be represented by a single number on an interval scale; which can be ascribed to it by the burglar without risk or uncertainty on a single inspection given no previous knowledge about the utility of the dwelling, except that it is drawn from the above-mentioned probability distribution (Flowerdew, 1976).

A stopping-rule best suited for comparison with the sequential behavior of residential burglars would be one that allows for the distribution function to be partly unknown to allow for minor spatial exploration of unfamiliar communities. The model should admit an unrestricted number of alternatives available for consideration since different burglars have different ideas of which attributes of a site are desirable. The cost in terms of time and effort of looking at each alternative should be allowed to vary by mode of transportation and by the urgency of the burglar. For example, a drug dependant burglar who has not managed his supply properly and is undergoing withdrawal symptoms will have an urgent need to burglarize a site while a casual recreational burglar will use more discretion.

Finally, the ability to recall should be neither absent nor absolute. Burglars often double back to exploit an opportunity observed previously. Many times houses will

remain on the "short list" to be checked from time to time until all the attributes are right. And conditions can change in a short period of time -- an occupant may return home. These are the desirable characteristics of an ideal stopping-rule model to compare with the search process of residential burglars. An examination of some of the most commonly used models will identify how useful they are for our purposes.

The Marriage Problem

Probably the best known stopping-rule model is the marriage problem. Lindley (1961, p. 47) states it as follows:

a known number, n , of ladies (or gents) are presented to you one at a time in a random order. After inspecting any number r ($1 < r < n$) of them, you are able to rank them from best to worst and this order will not be changed if the $(r + 1)^{\text{th}}$ lady (or gent) is inspected; she (or he) will merely be inserted into the order. At any stage of the "game" you may either propose to the lady (or gent) then being inspected (there is no going back!), then the game stops; or inspect the next lady (or gent); however, if you reach the last

lady (or gent) you have to propose. All proposals are accepted. What is the optimum strategy?

There are several problems with this model being applied to burglary search processes. First, the decision-maker has no prior knowledge of the underlying probability distribution. Research has demonstrated that most residential burglars search for crime sites in known or close-by communities (Rengert and Wasilchick, 1985). Therefore, the underlying probability distribution is known to a great extent. A pertinent question is why burglars choose one probability distribution over another.

Secondly, the model assumes that there is a known finite number of alternatives. Burglars do not have a known finite number of alternatives available to them. They can always extend the search if a choice is not made. The only circumstance in which a finite number of alternatives are available is when there is extreme urgency and time is limited to the burglar. In this case, we can assume that the burglar can only evaluate a limited number of homes (before a curfew or other time constraint).

Third, there is no observation cost in time or effort. Again this is not realistic for a residential burglar, especially one who is on foot searching for a crime site.

Finally, the marriage problem does not allow recall of alternatives already passed over. Most of the burglars we interviewed including all of the suburban burglars, will routinely keep attractive houses that they are interested in on a mental list to be returned to and checked until the right opportunity arises. An example may clarify this generalization.

In late June, Burglar D passed up an attractive house that fit his criteria (cul-de-sac, backed up to the woods, positioned properly relative to neighbors etc.) because it had a basketball court in the drive and a bicycle next to the garage. "This tells me there are children around, and you never know what kids are going to do or where they are going to be. I pass on this house. But, in like September or October, when I'll know where the kids are, I'll check it out again."

The most common reasons to pass up an attractive house are because someone is home or there is activity in the neighborhood. Many burglars store the attributes of attractive targets in their memory for later use either on the present search or to return to at a later date. With this in mind, we can assume that the recall assumption of the marriage problem has limited validity; it is only valid if the site is not burglarized when it is found suitable and the situation changes and the opportunity is lost.

If the marriage problem were applicable to residential burglary, the optimum strategy is to pass the first n/e choices (where e is the constant 2.718) and to choose the next site which is better than any of the passed over group. The probability that that site is the best in the set of possibilities is then $1/e$ or .386.

The marriage problem stopping rule maximizes the probability that the best alternative will be selected. However, there is a high probability that it will produce an inferior result, especially if the best alternative is among the first n/e evaluated. In this case, the rule dictates the selection of the last alternative inspected regardless of its attributes. This is where recall is important.

The Marriage Problem With a Known Sampling Distribution

The marriage problem can be made more applicable to the residential burglary process by assuming that the decision-maker knows the distribution of the utilities assigned to the alternatives. This is analogous to the burglar choosing the community before starting the active search process. The attributes that he must accept or reject then constitute a sequential random sample from this known distribution. This is a much more reasonable assumption. Problems still remain in that the burglar can only take the last alternative

examined with no recall, there are no costs involved in the search, and the number of alternatives available is assumed to be known.

This model also does not consider an accumulation of experience during the search process. Rather, the solution is to set a criterion value and to select the first alternative whose utility exceeds this value. However, the criterion can be lowered as the length of the search process increases. Best alternatives are most likely to be selected if high standards are initially set and lowered monotonically as the search process proceeds (DeGroot, 1970). In this case, a change in aspiration level may be viewed as a rational act rather than as a panic response to a shortage of time. If this change in aspiration level is added to an optimal stopping rule, the probability of choosing the best alternative converges to .580 for large choice sets. If the simple stopping rule of choosing the first alternative better than a fixed constant is adopted, the probability of choosing the best site drops to .517 (Flowerdew, 1976). However, the desired quality of recall is not contained in either marriage problem.

The House-hunting Problem

The house hunting stopping rule allows the decision-maker to recall past alternatives. It is stated by MacQueen and Miller (1960) as follows:

For illustration consider the investor who is interested in the possibility of buying a house. In the first place he must decide whether or not to search, or "hunt", for a house at all. If he decides to "hunt" he may eventually find a house that is a reasonably good buy. The question then arises, should he settle for this one or continue to search for another, better prospect? If he continues the search there will be additional costs in terms of time, effort, and quite possible lost return on the immediate investment....Thus, in order to determine when the search should be stopped he must somehow weigh the possibility of finding a more suitable investment against the costs and risks of further search.

This model seems the most appropriate for analyzing most residential burglary search processes. It assumes a cost in terms of time and money involved in the search process, it allows recall of previous observations, and there is no finite set of observations from which a choice

must be made. The cost is assumed to be a fixed cost per observation. In the case of residential burglary, this cost may be assumed to be fixed per thousand feet of space searched since observations occur nearly continuously in most urban and suburban environments. Therefore, the net payoff after n observations (n thousand feet) is equal to

$$\max (x_1, x_2, \dots, x_n) - cn$$

where x_i is the value of the i^{th} alternative to the burglar. c is the cost per observation and n is the number of observations or distance observed. The solution is given in terms of a fixed cut-off point, x^* , on the distribution of values, such that the burglar should accept the first site examined with a value greater than x^* . If the distribution of values of alternatives is $f(x)$, x^* can be obtained from the equation:

$$\int_{x^*}^{\infty} (x-x^*) f(x) dx = c$$

If $f(x)$ is a normal distribution, x^* is the value which maximizes:

$$\frac{f(x^*) - c}{\Pr (x > x^*)}$$

Note that x^* is a function of the cost of observations and is dependent on the underlying probability distribution.

However, it is independent of the order in which observations are made. Also, although recall is allowed, this model does not depend on recall, for the solution involves acceptance of the first alternative better than x^* . This is a form of satisficing behavior although it is optimum in terms of maximizing the expected payoff to the burglar. This seems realistic from our experience with most of the residential burglars' search processes. A closer look at the residential search process from the burglar's perspective will further clarify the usefulness of these models.

The Residential Search Process of Burglars

An important part of this ethnographic research is a "ride along" in which the authors accompanied the burglars in a simulated search for a crime site. The authors rode along during this process to observe where the burglars began their active search, the amount of time required to select a burglary site and the number of communities searched during the process. Our curiosity especially focused on aspects of the home search model, its stopping rule and how these principals varied between burglars operating in various environments. The distances involved in the criminal search processes were noted as aspects of the time and effort (costs) involved in the burglary process. The estimated value of the house chosen was an estimate of

the potential gain. Discussion during and after the search process identified strategies for selecting a site.

Early on it became apparent that different burglars used different search strategies. Extreme examples are outlined below to illustrate the important principles involved.

Burglar A is a suburban burglar, who was very active and sometimes burglarized very expensive homes in the suburbs of Wilmington, Delaware. His search strategy was one that minimized the costs involved in the search process. He attempted to make the spatial search an enjoyable process in which time was not a constraining variable. As he explained, a typical scenario involved meeting his friend and accomplice about noon. They would buy a couple of six packs of beer and begin cruising around "nice" suburban neighborhoods.

There was no urgency involved in locating a crime site. Rather, they enjoyed viewing the houses and almost made a game of predicting if anyone was home in houses with desirable attributes of wealth. As they drove along through residential areas drinking and talking each would watch one side of the road and point out attractive houses and note the presence of cover, the absence of alarms and other important attributes. If they spotted a particularly

desirable home early in the search process, they would take note of its location and continue on. Only in the middle of the afternoon when the beer was consumed did they "get serious" about making a choice. This "cruising around" search process was remarkably similar for other suburban burglars.

These burglars thus had constructed a "short list" of prospective homes in their leisurely drive through suburban communities. Through recall, they would discuss which to choose or rank highest. They would return to this location and actively case the home and surrounding neighborhood for signs of activity and occupancy. If either was observed, they would proceed to their second choice, etc. In this suburban region which contains many dual career families, they generally were successful in identifying a burglary site early in their active consideration of their short list. Often these were sites which contained obvious signs that no one was home -- uncollected mail, a meter readers card attached to a door, or no footprints a day or two after a snowfall.

To summarize, Burglar A minimized subjective cost by making the search an enjoyable process. It was almost a game for him. He did not have a fixed cut-off point x^* . Rather, he and his companion evaluated the best sites they had observed in their leisurely drive. However, they were very

familiar with the sampling distribution. They would not consider communities which contained homes below a set value. They considered only upper middle income and wealthy communities in what was described as "Dupont country". Therefore, their stopping rule was essentially a time rule. They stopped their active search when the beer was gone and it was time to "get serious" about evaluating their short list of sites. For the other suburban burglars, time rather than beer was the critical factor. A decision had to be made before school let out and neighborhood activity peaked, or the burglary would have to be put off and the house returned to the short list. This seems to be very close to a maximization process evaluated in terms of expected returns where costs of search are discounted. It is like the house hunting problem with a known sampling distribution where recall is allowed and cost of the search is minimal.

Example 2 is at the other extreme. Burglar Y is a drug dependant burglar who was active in West Philadelphia. His search process is very close to the marriage problem where the cutoff value is very low. He evaluated sites only with regard to their occupancy. He would burglarize very low income homes if he determined they were empty. He even burglarized occupied homes late at night while the occupants were asleep if his drug dependency required immediate money. When asked why he would burglarize such a run-down property, he responded, "Everybody got something, a vcr, at least a

television." In other words, there would be something of value in almost any home.

Burglar Y usually began his search process around 8:30 in the morning. He would walk through neighborhoods on his way to a drug purchase and observe people leaving for work, school, or for what ever reason. He especially noted women leaving. He reasoned that if the woman left the house, a man is not likely to be home. He understands that the neighborhoods he exploited had many single-woman head of households. This burglar's fixed cut off point is simply whether the home is occupied at the time he observed it. He would burglarize the first home he encountered that he determined to be unoccupied, where there was no neighborhood activity and that had an identifiable entry point.

Costs in terms of time and effort are very critical to Burglar Y. He carries out the search process on foot and finds no enjoyment in the search. He must always consider his drug dependency and often must minimize time to make sure he has enough to "get through and start off." Also, if an opportunity is not seized, it may not exist an hour later. Homes often are not unoccupied for predictable periods of time while people are at work in this area because of chronic high unemployment. Therefore, the possibility of finding a more suitable site is not great in

terms of the costs and risks of further search. This burglar is very opportunistic.

Burglar Z is a drug dependant suburban burglar with a similar pattern. When "wired out" he picks the first "development that looks good and go to every house." He approaches every house with out obvious signs of activity and knocks on the door. If there is no answer, he breaks in, and continues on to the next likely house in the development. Although he goes from house to house in a chosen development, note that he skips over developments that do not appeal to him.

Burglar Z's goal is to never run out of drugs or money. He is more mobile than Y, and has a more affluent set of neighborhoods to choose from, but Z is equally opportunistic in exploiting houses immediately when he determines they are available, if they are in good neighborhoods.

Although both are very opportunistic, note that they are not necessarily irrational from an economic perspective. Given the cost of Burglar Y's search, it seems rational to stop the process early on to maximize his gain. His drug dependency is an important issue here. If he felt he needed a drug fix at night and he had no money, he would burglarize occupied homes if he could discover a relatively quiet means of entry. His drug dependency and mode of transportation

(foot) increased the costs involved in an extended search markedly.

Other burglars tended to fall between these two extremes. They can be categorized in terms of the costs involved in the spatial search process. The suburban burglars all had access to an automobile and on the whole, expended more time searching for a crime site even if they were drug dependant. Table 3 lists the model which most closely describes the search strategy for burglars living in Philadelphia, Wilmington, and suburban communities; by drug dependant and drug free burglars; and by those who used a car and those on foot.

Burglars were classified as exploring the "first opportunity" if they burglarized the first house they found that was not occupied. Burglars were classified under the "marriage rule" if they had a criteria in mind as to what is an acceptable house to burglarize. They would pass on obviously unoccupied houses if they did not fit their criteria of wealth, cover, or other factors. However, they would burglarize the first home encountered that matched or exceeded this criteria. Burglars were classified under the "house hunting" criteria if they developed a short list and then backtracked to exploit the best house on the list. Notice that the majority of drug dependent burglars did not develop a short list or backtrack. The

TABLE 3: Stopping Rule Models

Burglar	First opportunity	Marriage rule	House Hunting
Burglar A			x
Burglar B		x	
Burglar C		x	
Burglar D			x
Burglar E		x	
Burglar G			x
Burglar K		x	
Burglar L		x	
Burglar M		x	
Burglar P		x	
Burglar R			x
Burglar T			x
Burglar V			x
Burglar Y	x		
Burglar Z		x	
Drug Dependent	100%	50%	30%
Drug Free	0%	50%	70%
used car	0%	50%	70%
on foot	100%	50%	30%

majority of drug free burglars developed a short list and backtracked to the best house on the list. The majority of these used a car in their burglaries. Considerable time is required in these latter burglaries.

Burglars who exploit the first opportunity they encounter, or who do not develop a short list, have shorter distances and more clustered burglary sites. The question we must address is what the burglaries are clustered about. In other words, we must consider anchor points that orient their search process in certain directions from their homes. The question now turns on the spatial pattern of burglaries which result from these spatial search processes.

Spatial Patterns of Burglaries

Here we wish to consider the relative location of burglarized sites. As a burglar searches for a home to burglarize, a sequence of homes is viewed. Each home has a set of attributes and a location. The attributes of homes are important considerations of "stopping rules". The locations of the homes viewed on a burglary search constitutes a search pattern which can be mapped. These search patterns may be generalized by fitting statistical models to their spatial patterns. Different models are designed to generate or replicate the results of a general search pattern.

In order to determine the degree of spatial bias in a burglary search process, we must establish some base line cases (or models) with which to compare actual journeys. The literature provides several examples of the patterns we can expect if different assumptions are applied to burglary search behavior.

The simplest case is a uniform pattern in which we do not identify any preference for a particular direction or distance as the burglar considers areas within a region in which burglary opportunities are ubiquitous. This model of burglary discounts the importance of decision making on the part of the criminal. As stated by Reiss (Reiss and Tonry,

1986, p. 6), "It seems doubtful, however, that individual offender decisions largely account for differences in the concentration of crime in space, given the ubiquity of criminal opportunities." This search pattern is a uniform pattern in that each community in the region has an equal probability of being selected.

This uniform pattern can be modified by considering constraints on the search pattern of the burglars. The most common constraint considered is a distance constraint or distance bias. Since it requires time and effort to overcome distance, there is theoretical reason to believe that burglars will tend to exploit opportunities close to an origin point (usually their home) rather than travel farther to exploit an opportunity with equal attributes. This model describes a distance bias which clusters crimes about the home of the criminal. As stated by P.L. and P.J. Brantingham (1984, pp. 345-346), "Searching behavior starts from home and first covers likely areas that are 'known'....The distribution of offenses around the home base of the criminal would look like a bull's eye with many 'hits' close to the center. If there are no conditions to distort the pattern, the offenses should be spatially dense close to the home location and should gradually decline in frequency as distance away from home increases." This model defines a burglary search pattern focused on the home.

There are conditions which may distort this spatial model. The Brantinghams (1984, p. 346) note that risk of apprehension may result in few crimes being committed on the same block as the home (Turner, 1969). We found this to be the case for three urban burglars who stated that they would never burglarize a home in their own neighborhood. As Burglar G stated, "the other side of the tracks is where the hunting starts." The uniform pattern and the distance biased pattern may also be modified by introducing a directional preference. Burglars generally prefer to operate in more familiar rather than less familiar areas. This may define a directional preference toward familiar sites and along familiar paths such as the route to work (Rengert and Wasilchick, 1985). This would establish a distance bias focused on the home, but a directional bias focused toward or along a familiar route. In fact, crime search may emanate from a site other than the home (such as a shopping mall, a bar, or a drug sales area.) This would define a third model in which the distance bias orients about an anchor point other than the home. This orientation may be a form of distance minimization in order to decrease the time and effort required in the total criminal process. For example, if a burglar plans to fence the burglarized articles immediately after a burglary, he would save effort, time and therefore vulnerability to apprehension if he committed his burglary in the direction of the fence rather than in an opposite direction. Those who use the proceeds of burglary

to buy drugs may orient their criminal activity in the direction of the drug supplies, again to save time and effort. In fact, if a considerable amount of time is spent in the drug sales area, it may act as a primary anchor point in place of the home. This would describe the third model in which the distance bias emanates from an anchor point other than the home.

A fourth model is possible if the home and another anchor point both impact the crime search behavior of the criminal. In this case, we would find a bimodal spatial distribution of crimes with crime sites clustered both about the home and another anchor point. A variation of this fourth model is when the home and another anchor point operate simultaneously to cluster crime sites between and among them. In this case, we expect a 'teardrop' pattern with most of the sites clustered about the dominant anchor point (Huff, 1984). The stronger the distance bias of these anchor points, the more likely the burglaries will be clustered about a straight line between them. Again, if one anchor point has a much stronger attraction than the other, the resulting pattern will be a tear-drop pattern focused on the dominant attraction node.

Once a successful burglary has been committed, the information gained from the experience reinforces positive images the burglar has about a specific community. This

makes the same community more likely to be chosen for a second, third, or later search process; as long as the burglaries are successful and reinforce a positive image of the community. This identifies a modification of the distance and directional bias termed "areal persistence." It is characterized by a clustering of burglary sites in a single community.

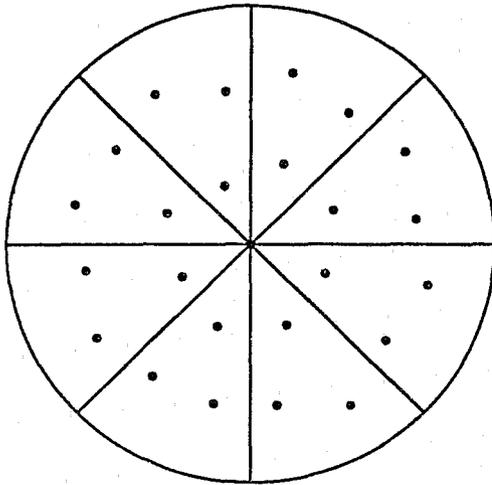
Figure 1 (a,b,c,d) illustrates each of the cases discussed above. At this point, we are not sure which model most accurately describes the behavior of residential burglars. No research exists which compares the relative applicability of each. In fact, the case may be that different models describe the behavior of different burglars depending on characteristics of the burglar and the environment within which he is active.

We are interested in which of the above patterns the burglaries committed by the informants of the present study best fit. Theoretically, one would expect burglars who are not drug dependent and who are more concerned with risk than with maximizing the gain of a burglary to choose burglary sites clustered about their home (Figure 1 b). We expect the casual drug user to exhibit a bimodal configuration which focuses both on the home and a drug supply area (Figure 1c).

FIGURE 1

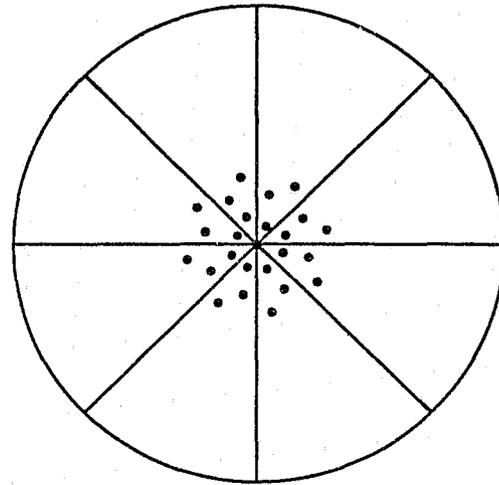
Hypothetical Spatial Patterns

a.



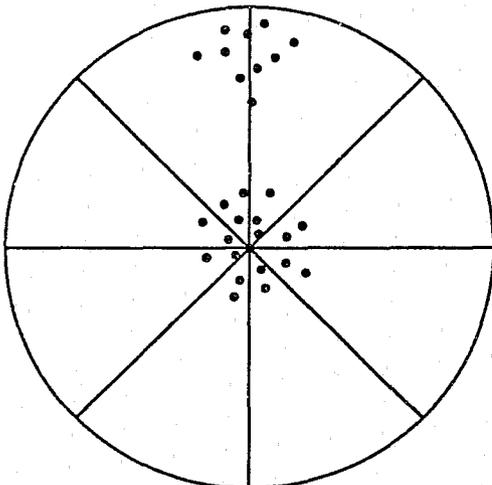
Uniform Pattern

b.



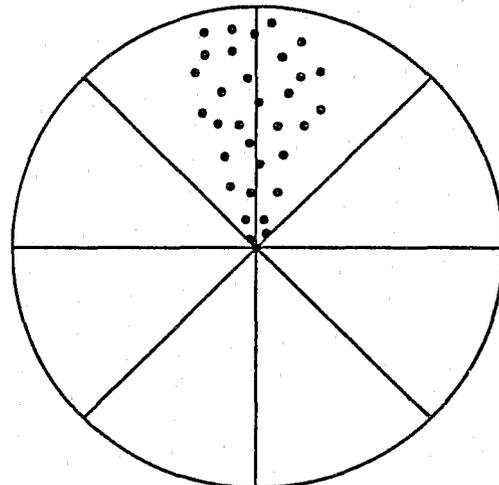
Distance Bias

c.



Bimodal

d.



Directional Bias
(or Teardrop)

For those individuals who are drug dependent and burglarize houses to supply their drug habit, we expect the home to become less dominant, and the drug sales area more dominant in the pattern of burglaries. In this case, a tear drop configuration results which focuses on the drug sales node (Figure 1 d). Here, burglaries may cluster more about the drug sales area than home or vice versa.

These models assume that opportunities for burglars are ubiquitous. A modification of the tear drop model may arise if several burglars focus their criminal activity around a single drug supply area over an extended period of time. In this case, the area immediately surrounding the drug sales node may become "fished out." That is to say, at some point in the past, burglaries were so frequent in this area that many home owners have abandoned the area and moved to a safer community. Those residents who remain may have fortified their homes, securing entry points that have been used by burglars in the past. Therefore, there may not be many remaining opportunities for burglary in the area immediately surrounding the drug sales area. Drug users desperate for money may be displaced into more violent forms of street crime in this area (street mugging, purse snatching and shakedowns); we are not sure at present. Further research is required to document this scenario. If it is in fact the case, burglary will be pushed outward to where opportunities still exist. A spatial model of burglary

in this area resembles a teardrop with a hole in the middle of the drop, or an elliptical doughnut (Figure 2). It can be observed by noting the distance of the nearest burglary site to the drug sales area for drug dependant burglars.

The spatial patterns of burglaries of each of the informants of our study are examined to see which model best describes their spatial pattern. We use an area based model in which the probability of committing a burglary in identified areas is examined. The study areas are identified by drawing a circle about the home of each burglar. The radius is the distance to the farthest burglary committed by the burglar. A straight line is drawn between the home of the burglar and the drug supply locations for drug dependant burglars. For burglars who are not dependent on drugs, a straight line is drawn between the home of the burglar and the center of the city they live in or the nearest city to where they live. This line is labeled zero degrees and sectors are then drawn 45 degrees apart from this line. Next, the area of the circle is divided equally and an inner circle is drawn which encloses half the area of the total circle. Therefore, sixteen inner and outer sectors are identified as illustrated in Figure 3.

The number of opportunities for burglary at this point is assumed to be equal for each of the sixteen areas. Fifty opportunities are picked for each circle and assigned a

FIGURE 2

"Fished Out" Attraction Area

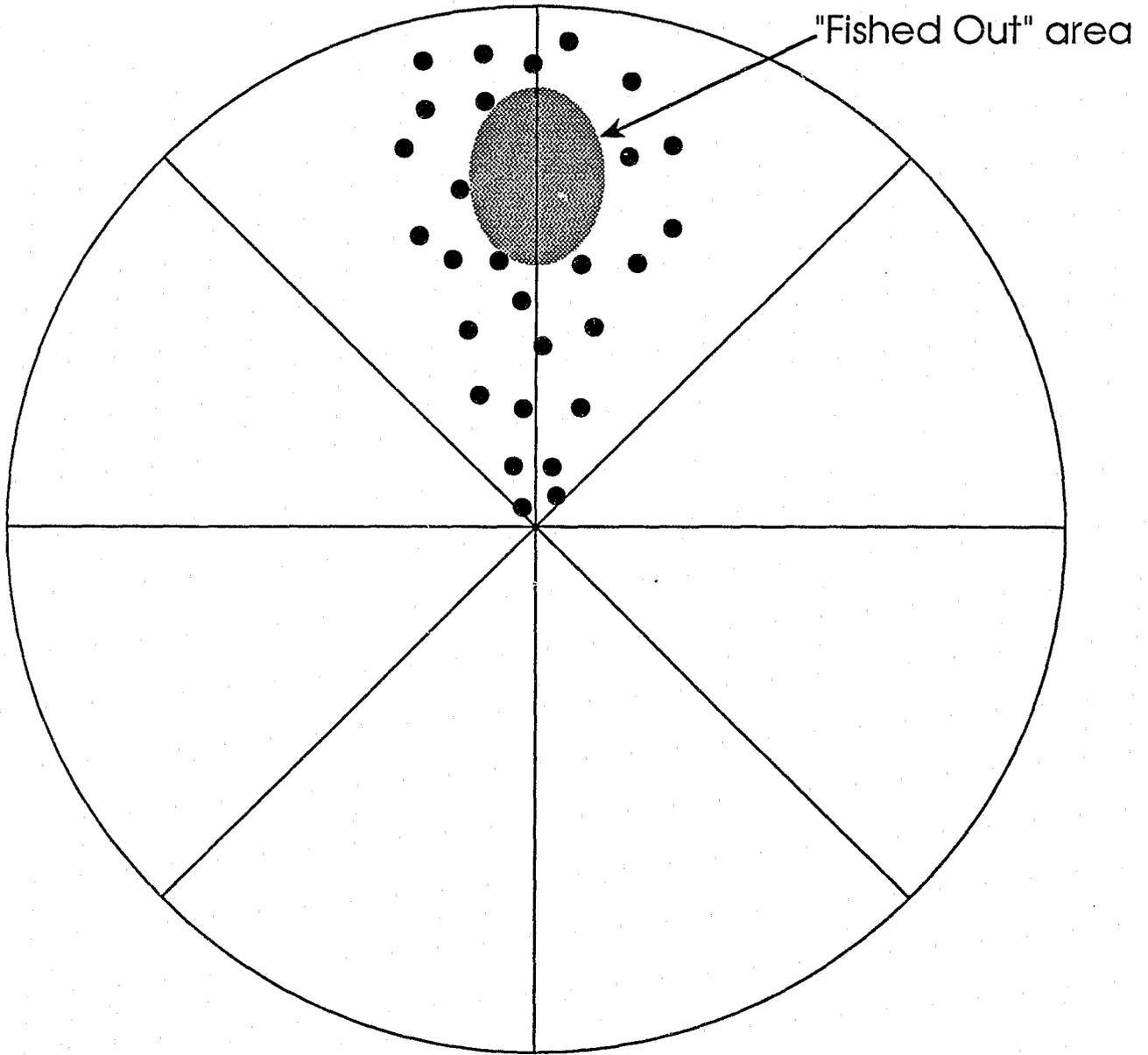
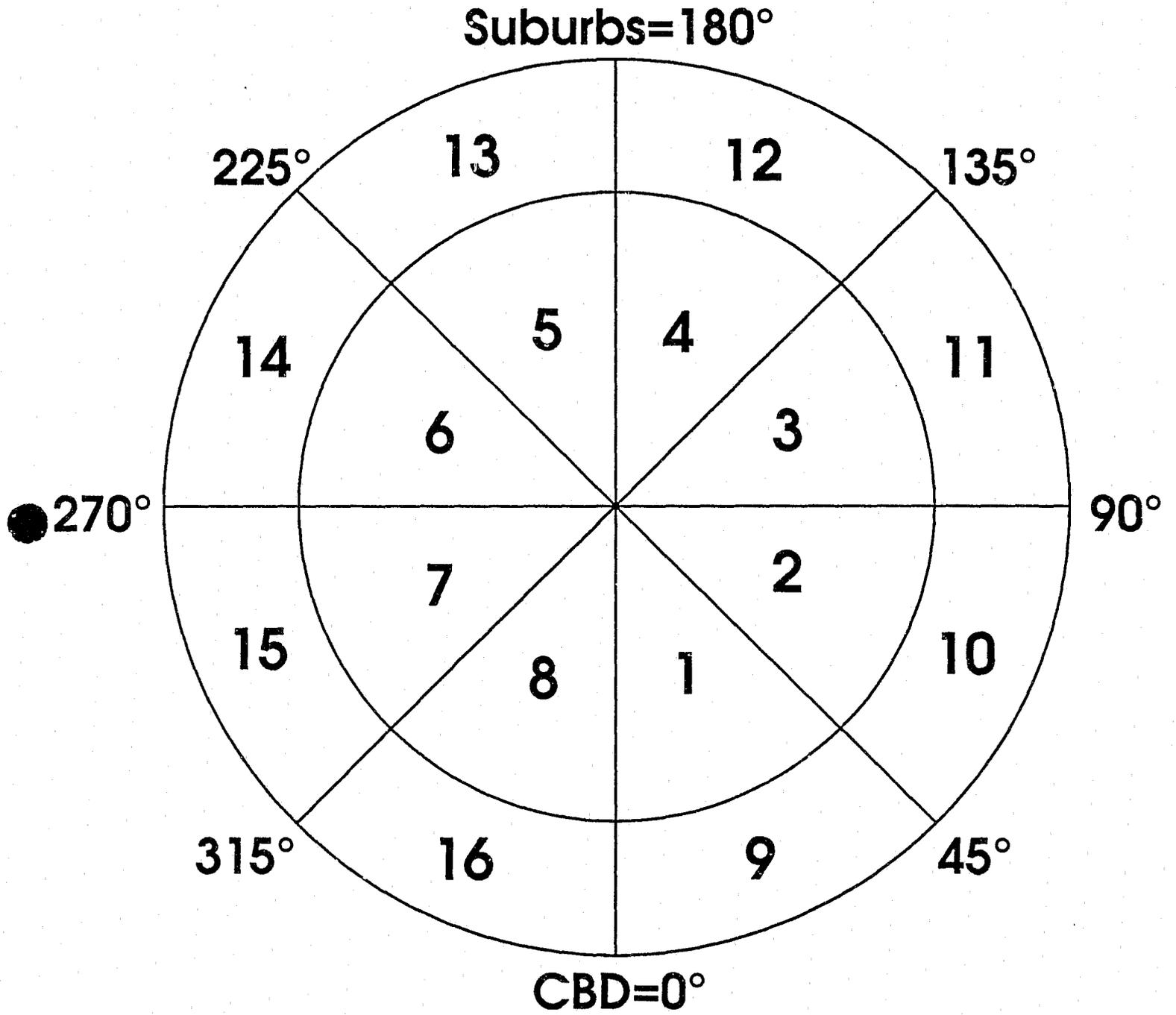


FIGURE 3



number whose range lies uniformly between the distance from the shortest burglary trip to the inner circle for areas one through eight, and the distance from the inner circle to the outer (longest burglary trip) for areas nine through sixteen. The number of burglaries predicted in each circle is calculated from these numbers and the distances to actual burglary sites, and an analysis of the directional bias in the burglary trip determines which sector. This number can be compared with the actual number of burglaries committed in each area. The following formulas were used to calculate the expected number of burglaries in each circle:

Uniform pattern $p_i = 1/N = .0625$

where: p_i is the probability of a burglary being in the i^{th} area

$N = 16 =$ the number of areas

Home oriented distance decay:

$$p_i = \frac{e^{-\alpha d_i}}{\sum_{j \neq i}^N e^{-\alpha d_j}}$$

N is the number of burglary opportunities; d_i is the distance between the home and the i^{th} burglary opportunity.

$\sum_{j \neq i}^N d_j$ is the distance between home and all other burglary opportunities.

e is the exponential function

α is the empirically defined distance decay function.

Anchor point distance decay (such as a drug supply area) with directional bias:

$$p_i = \frac{e^{-\alpha d_i}}{\sum_{j \neq i}^N e^{-\alpha d_j}}$$

where d_i is the distance from an anchor point other than the home such as a drug supply area.

Other parameters and constants are as before.

Multiple reference point model (bimodal) with directional bias as before:

$$p_i = u \left[\frac{e^{-\alpha_1 d_{i1}}}{\sum_{j \neq i}^N e^{-\alpha_1 d_{j1}}} \right] + (1-u) \left[\frac{e^{-\alpha_2 d_{i2}}}{\sum_{j \neq i}^N e^{-\alpha_2 d_{j2}}} \right]$$

where d_{i1} , is the distance between the crime site and the first anchor point.

d_{i2} is the distance between the crime site and the second anchor point

u, α_1, α_2 are parameters to be estimated in the model.

Directional bias is estimated as $p_i = B_i/n$

where: B_i is the number of burglaries in the i^{th} sector,

n is the total number of burglaries.

In a multiple reference point model, the problem becomes one of determining the relative importance of each anchor point in focusing the search. The burglar may trade-off the distances from the respective anchor points differently depending on the attributes of each anchor point. For example, if a burglar commits some burglaries alone and some with a group whom he meets at a drug sales area or bar, the pattern of burglaries may be bimodal with relatively high densities near the home and near the bar he starts out from on the respective search processes. On the other hand, if a burglar always searches for sites alone, he may be oriented toward an alternative anchor point such as a drug supply area. In this case, we expect burglaries to be oriented along a route between the home and the drug supply area.

Multiple reference point model with directional bias (tear drop):

$$p_i = e^{-\alpha_1 d_{i1} - \alpha_2 d_{i2}} / \sum_{j \neq i}^N e^{-\alpha_1 d_{j1} - \alpha_2 d_{j2}}$$

where:

d_{i1} = distance between the crime site and anchor point 1.

d_{i2} = distance between the crime site and anchor point 2.

α_1 and α_2 are parameter to be estimated

The intensity of search in this case will have elliptical contour lines with anchor point 1 and anchor point 2 as focal points if α_1 equals α_2 . If the burglar's search is oriented primarily around anchor point 1, then $\alpha_1 > \alpha_2$ which implies that the contours will be distended in the direction of anchor point 1 resulting in a "tear drop" shaped search pattern. The highest concentration of burglary sites would tend to occur along the axis connecting the two reference points with an orientation toward the dominant case. As the parameter values of α_1 and α_2 increase, search would tend to be more concentrated along the axis between the two anchor points with an orientation toward the dominant anchor point.

These models provide the parameter values which can be used to predict the expected number of burglaries which will occur in each area. We can calculate the parameters and test which model most accurately describes actual burglary sites chosen by burglars in this study. The latest eight burglary sites identified by each burglar are compared with the residence of the burglar. For those burglars who had a drug

dependency, the location of their drug supply is also compared with burglary locations in the alternative anchor point and the multiple reference point models. Therefore, the observed spatial pattern of burglaries and the locations of the home and drug supply site serve as the basis for estimating the parameters in the search models.

The parameters are estimated separately for each burglar using logit models and standard maximum likelihood methods. Given maximum likelihood estimates of the parameters, the expected patterns of burglaries generated from the models is compared to the observed pattern. The comparison between expected and observed patterns is in terms of the area where the actual and predicted burglaries occur.

Table 4 lists the parameters estimated for each model, and the stopping rule used by each burglar. Notice that the Philadelphia burglars (first five burglars) have much larger distance decay parameters than suburban burglars (last five burglars). This means that their crime sites are much more clustered about an anchor point than is the case in Wilmington and the suburbs. The question revolves around which anchor point is the most powerful attraction to burglars. We are especially interested in the relative attraction of the home and the drug sales location on the spatial patterns of burglaries. This information is illustrated in the relative size of the parameters estimated by each model for each burglar. Only two of the fifteen burglars (both suburban burglars) have a larger distance decay parameter for their home location than for their drug sales locations (Burglars B and D). All urban drug using burglars cluster their crimes around drug sales locations more than around their homes.

The relative attraction of drug sales areas to drug dependent burglars can be illustrated graphically. We will use the three Philadelphia drug dependent burglars who committed burglaries on foot as is the usual case for inner city drug dependent burglars.

When we center a protractor on the home locations of Philadelphia drug using burglars and set the zero axis

TABLE 4: Estimated Parameter for Models

Philadelphia Burglars

Burglar Y	B ₁	B ₂	U
first opp.			
home	3.064		
drug		3.828	
bimodal	-.059	.177	.209
teardrop	.087	.107	

Burglar G			
house hunting			
home	.702		

Burglar E			
marriage rule			
home	1.532		
drug		1.937	
bimodal	1.531	1.917	-.970
teardrop	.092	.114	

Burglar M			
marriage rule			
home	.781		
drug		.851	
bimodal	.765	.850	-.970
teardrop	-.104	.252	

Burglar C			
marriage rule			
home	.936		

Wilmington Burglars

Burglar P			
marriage rule			
home	1.560		

Burglar K			
marriage rule			
home	.496		

TABLE 4: Estimated Parameter for Models (continued)

Burglar L marriage rule home	.769		
Burglar V house hunting home	.234		
Burglar R house hunting home	1.204		
Suburban Burglars			
Burglar T house hunting home	.367		
drug		.911	
bimodal	.366	.902	-.265
teardrop	.335	-.078	
Burglar A house hunting home	.624		
Burglar D house hunting home	.318		
drug		.319	
bimodal	.302	.319	-.006
teardrop	.000	.000	
Burglar B marriage rule home	.285		
drug		.281	
bimodal	.282	.281	-.099
teardrop	.435	.147	

TABLE 4: Estimated Parameter for Models (continued)

Burglar Z			
marriage rule			
home	.461		
drug		.433	
bimodal	.452	.432	-.022
teardrop	.018	.017	

toward their drug sales locations, the directional bias is apparent (Figure 4). Only two burglaries are outside the zero to forty five degree axis. When we center the protractor on the drug sales area and set the zero axis in the direction of the home, there is a much more scattered pattern predominantly in the opposite direction. Therefore, the tear drop model does not seem to fit the case of these drug dependent burglars (Figure 5). Figure 6 illustrates the location of burglaries with respect to the home for Philadelphia drug dependent burglars. Figure 7 illustrates the change in this pattern when the map is centered on the drug sales area for these burglars. The attraction of drug sales areas on these drug dependent burglars is apparent.

An idea of the usefulness of these models can be observed by comparing the percentage of predictions which were correct for each using the Philadelphia drug dependent burglars. Here, the expected number of burglaries in each area predicted by the models is subtracted from the actual number committed by each burglar in each area of Figure 3. Then, these values are summed ignoring the plus or minus signs. If there were negative correspondence between the expected and actual values, this sum would equal sixteen. Therefore, we divide sixteen into the sum to obtain the percentage of the predictions which are incorrect. The percentage correct is obtained by subtracting this number from one. These are the figures in Table 5.

FIGURE 4

Burglary Locations Mapped on the Home to Drug Sales Axis

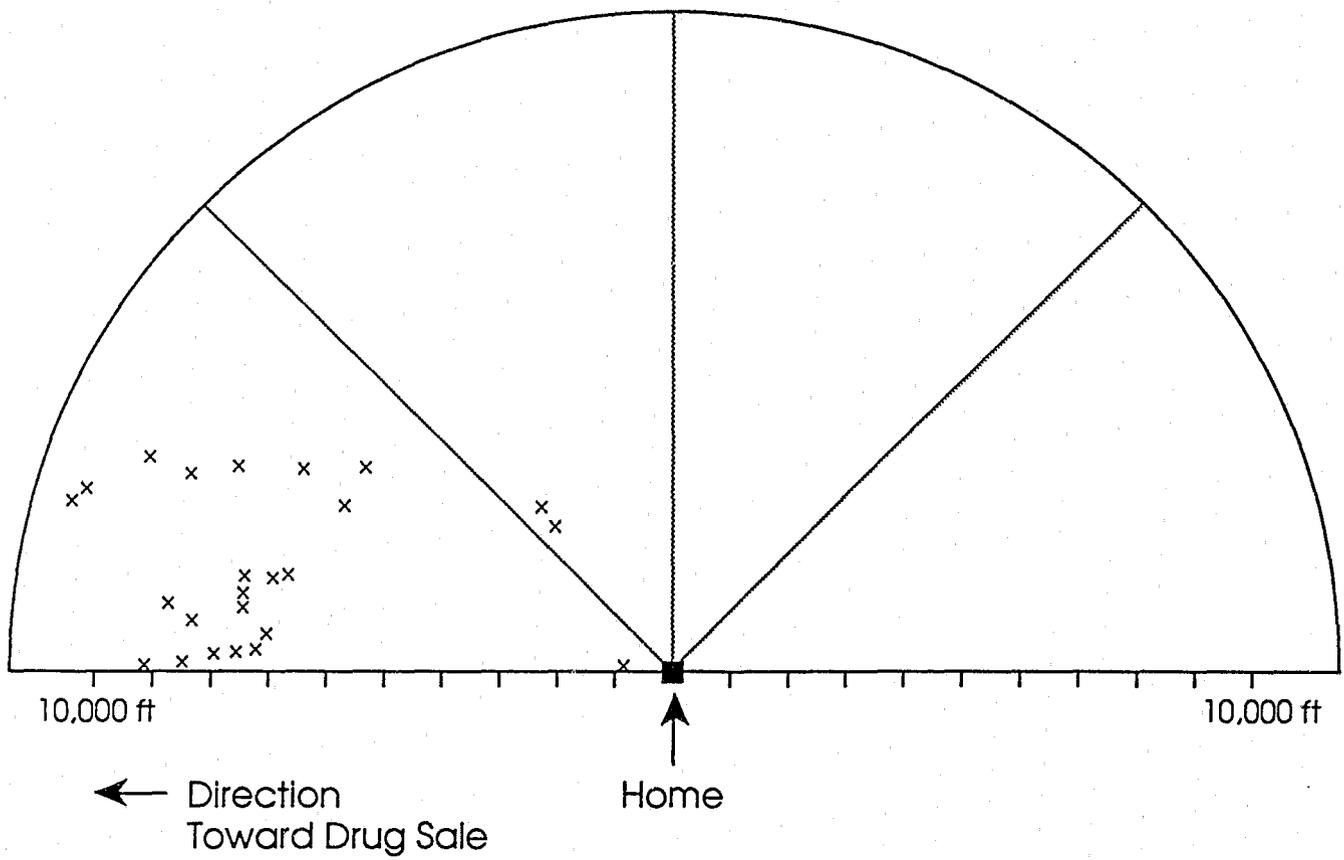


FIGURE 5

Burglary Locations Mapped on the Drug Sales to Home Axis

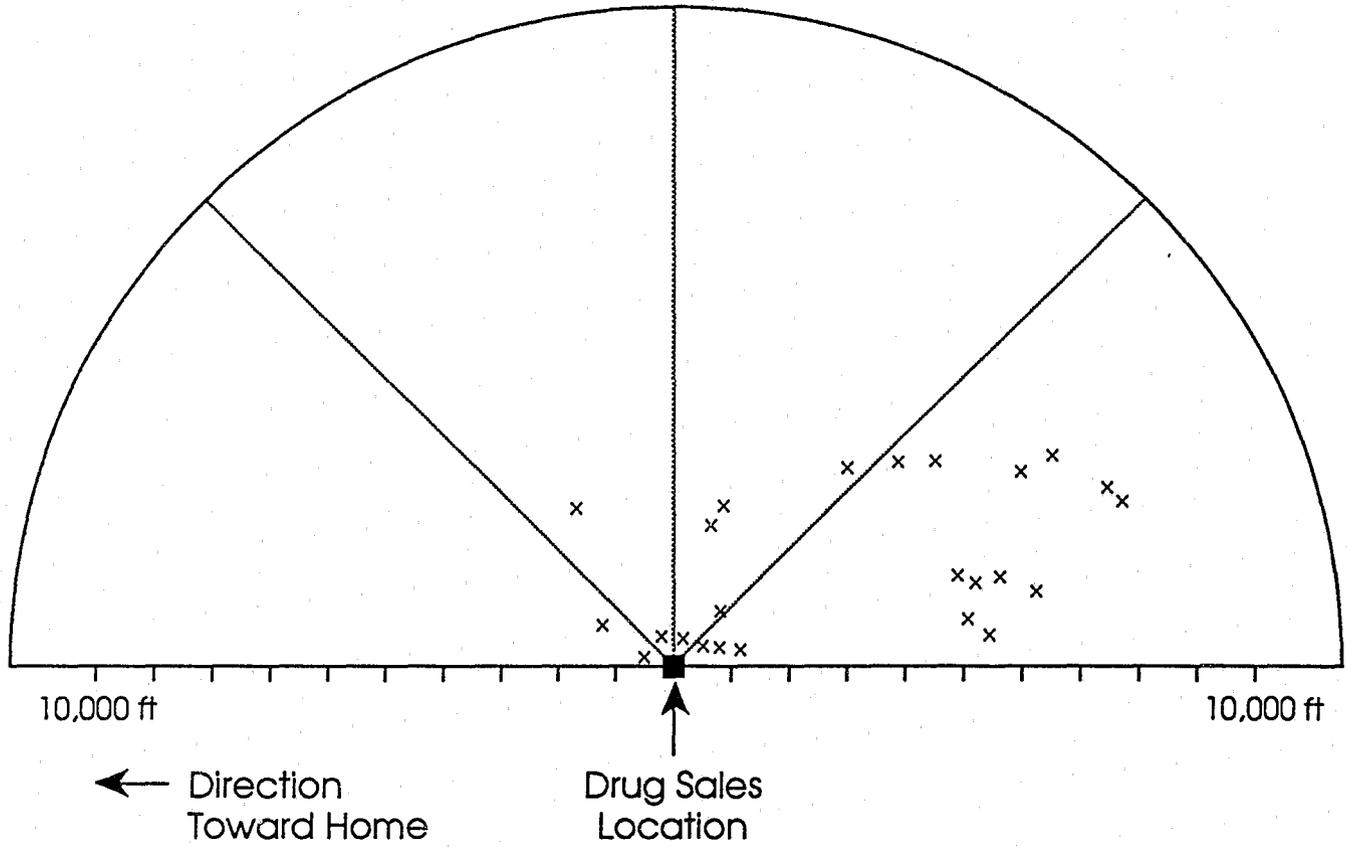
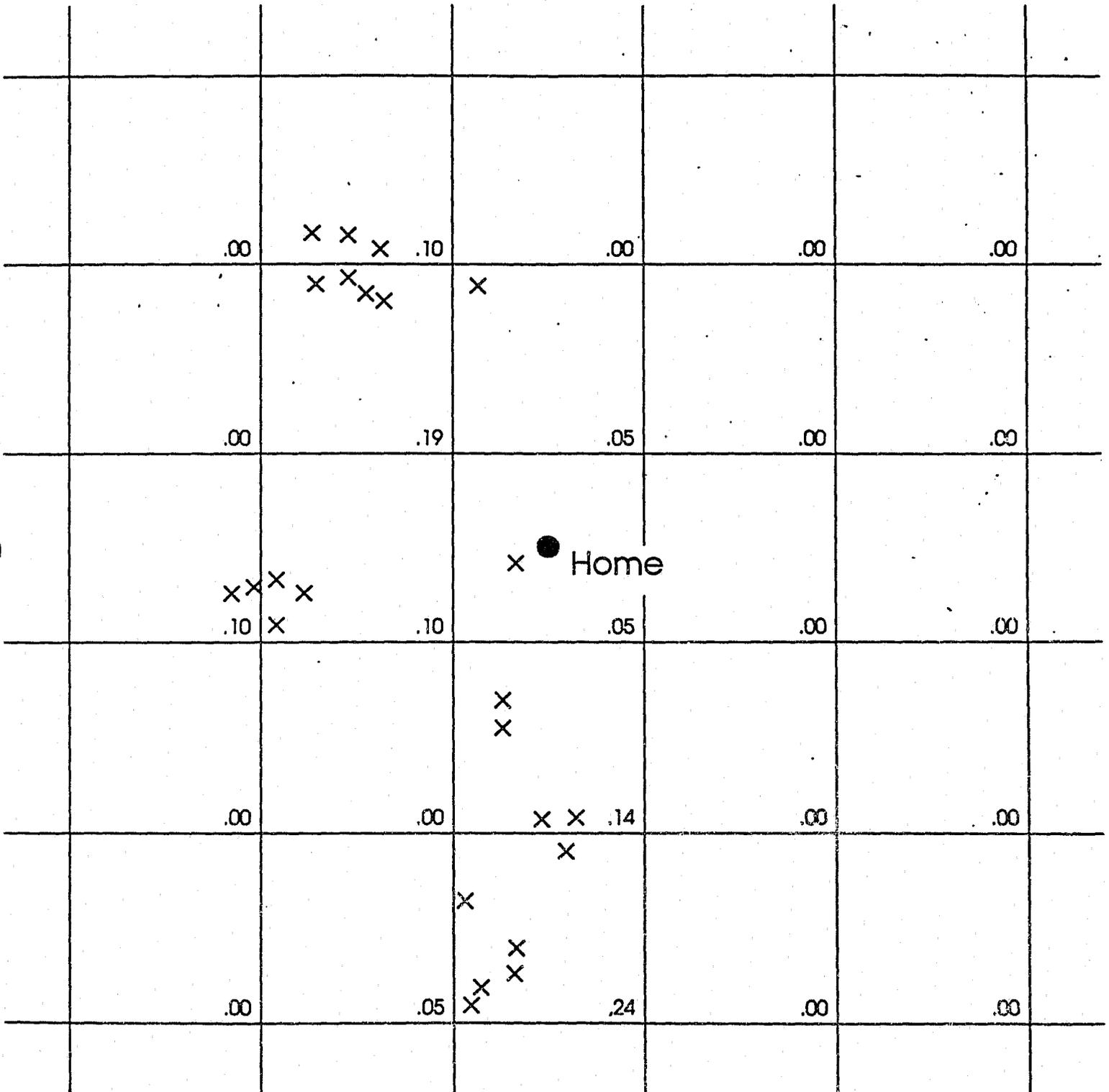


FIGURE 6

Orientation of Burglaries About the Home of the Burglar CBD

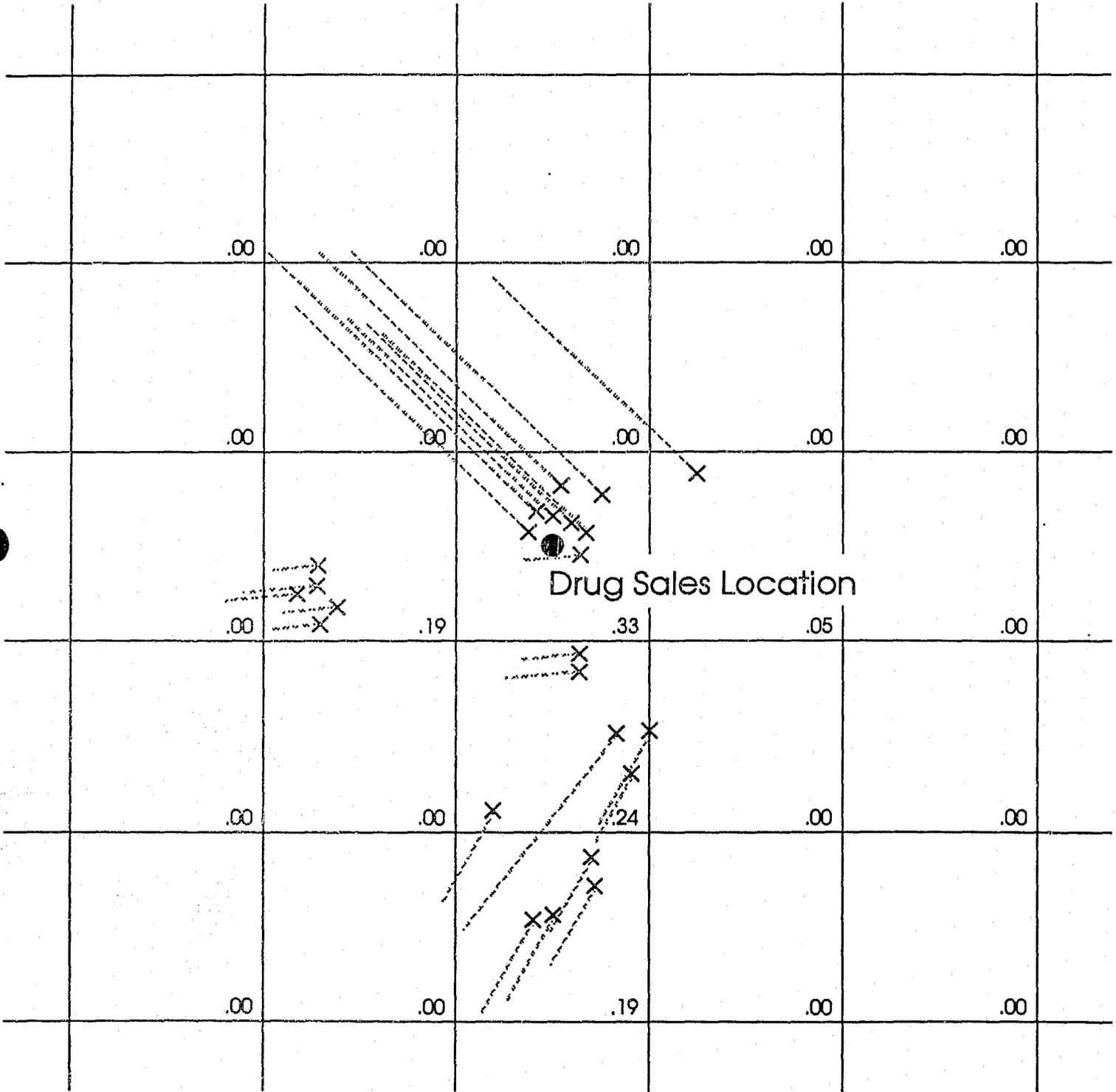


Each square is approximately 5 city blocks wide

Suburbs

FIGURE 7
 Orientation of Burglaries
 Toward Drug Sales Location

CBD



Suburbs

Notice that the logit models are an improvement over the uniform pattern in most cases. Also, the logit model based on the drug sales location is equal to, or a better predictor than the logit model based on the home of the burglar in every case. It is considerable improvement in the case of Burglar Y who does not have an automobile and burglarizes low income communities in an opportunistic manner. The least improvement is for Burglar E who burglarizes relatively wealthy communities in Overbrook around St. Joseph's University. He sometimes uses a car and sometimes does spatial exploration rather than stop at the first opportunity. The teardrop model biased toward the drug sales area fits his pattern of crimes very well.

TABLE 5: Philadelphia Drug Dependent Burglars: Percentage Correct Prediction of Area of Burglary

Burglar	Home uniform pattern	Drug uniform pattern	Home logit model	Drug logit model	Bimodal	Teardrop
M	12	12	42	50	50	32
Y	29	19	13	88	88	53
E	31	31	33	33	50	90

Impact on the Urban Infrastructure: Conceptual Generalizations From These Findings

Extrapolation of the Results

The ethnographic data stops here; but what if we extrapolate the patterns discovered to infer what the impact would be on our communities if we had fifty or one hundred burglars with similar spatial orientations to the burglars in our study? We are especially concerned with the impact of drug sales nodes on crime in surrounding communities, and the impact of these criminal processes on neighborhood viability. We hope this will tell us more about the relationship between neighborhood cohesiveness and criminal enterprises.

In talking to both drug dependent and drug dabbling criminals in this and previous research (Rengert and Wasilchick, 1985) it became apparent that drugs were procured from a variety of sources, both dealers and friends. We will classify these sources into a model which is useful in understanding the establishment and diffusion of drug sales in an urban community. This will establish a base from which we can interpret the burglary data of this study. This exercise is an extension of previous research conducted by one of the authors in the early 1970's (Rengert and Muller, 1972). This research determined that at the hierarchical level, large scale drug wholesalers initially

chose major cities to establish drug sales networks. Once established in a city, evidence suggests that drug sales at the local level diffused outward in a contagious fashion from an initial sales location (Rengert and Muller, 1972). The nature of this local diffusion and its relationship with local criminal activity unfortunately have never been identified to the author's knowledge. We identify a simple model that if verified through more extensive research will clarify this relationship and suggest certain policy implications for combating the interrelationship of drugs and crime. What follows is a first step in this direction. We have interviewed informants who have used each of these drug sales stages.

Evolution of a Drug Market Place

In our model of the evolution of drug sales at the local level, we postulate four stages that characterize levels of development of the drug market at the local level. These four stages are characterized by combinations of two concepts used in marketing geography: the threshold and the range of the market. The threshold of a market is the volume of sales (number of customers) required to bring a specific sales organization into existence. It is the profits required to make the business viable. The range of sales is the distance consumers will travel to purchase the commodity in question. In the present case, we must use surrogate

measures of each. For example, we do not know the volume of drug sales necessary to bring a specific sales organization into existence since the drug sellers will not let us examine their books (sales records) for obvious reasons. We can obtain an idea of the threshold by using two related measures: 1) the amount of time during the day a sales location is in operation; 2) the number of competing sellers operating out of a specific neighborhood. If the sales volume is not enough to make it profitable to operate out of a specific location during the entire day, the seller may operate only at those times when volume is sufficient. An example would be outside high schools at opening and closing hours, but not during the school day. Another example would be sales out of a local bar during heavy business hours. The number of competing sellers operating out of a specific neighborhood (perhaps a three square block area) is a measure of sales volume since competing sellers are not likely to establish themselves around an already established dealer unless there are excess profits which they can tap into. We use these two factors as surrogate measures of the threshold of drug sales necessary to bring a specific type of sales organization into existence.

The range customers are willing to travel to obtain drugs also has never been examined directly to the authors knowledge. There are two surrogate measures that can be used to approximate this concept: 1) Whether the seller moves to the buyers locations at various times of the day rather than

remaining at a fixed location; 2) the mode of transportation used by drug purchasers to travel to a drug sales area. If the drug dealer moves to the sellers location (such as outside a school at opening and closing hours) the drug purchaser does not need to deviate from a routine travel path to purchase drugs. If a drug purchaser uses a car to travel to a drug sales location, they are likely to travel farther than if they are on foot. Therefore, these surrogate measures give us an idea of the relative distances drug purchasers are likely to travel to purchase drugs from a specific type of sales operation. Combined with our measures of the threshold of a drug sales operation, these factors allow us to categorize different forms of drug sales operations or drug markets at the local level. Our conversations with drug dependent burglars provided us with examples of each of these market types or stages. We begin by describing a relatively drug free region.

Stage 1: Casual non-place specific market

The initial sale of drugs in a region may be described as a casual non-place specific market. Here, drugs are given, sold, or traded to friends at parties, high schools, or places where youth gather such as shopping malls. In this case, a supplier may or may not have surplus drugs to distribute. Furthermore, the purpose of the gathering is not to distribute drugs. The "customers" did not come to the

location to obtain drugs. The distribution of drugs is a by-product of another function such as a party. Therefore, the distribution is not place specific and is not dependable. It may fluctuate from place to place and from time to time. It is a chance happening. However, at these chance gatherings, youth may develop a taste for drug use which establishes a market demand and a profit potential for an entrepreneur.

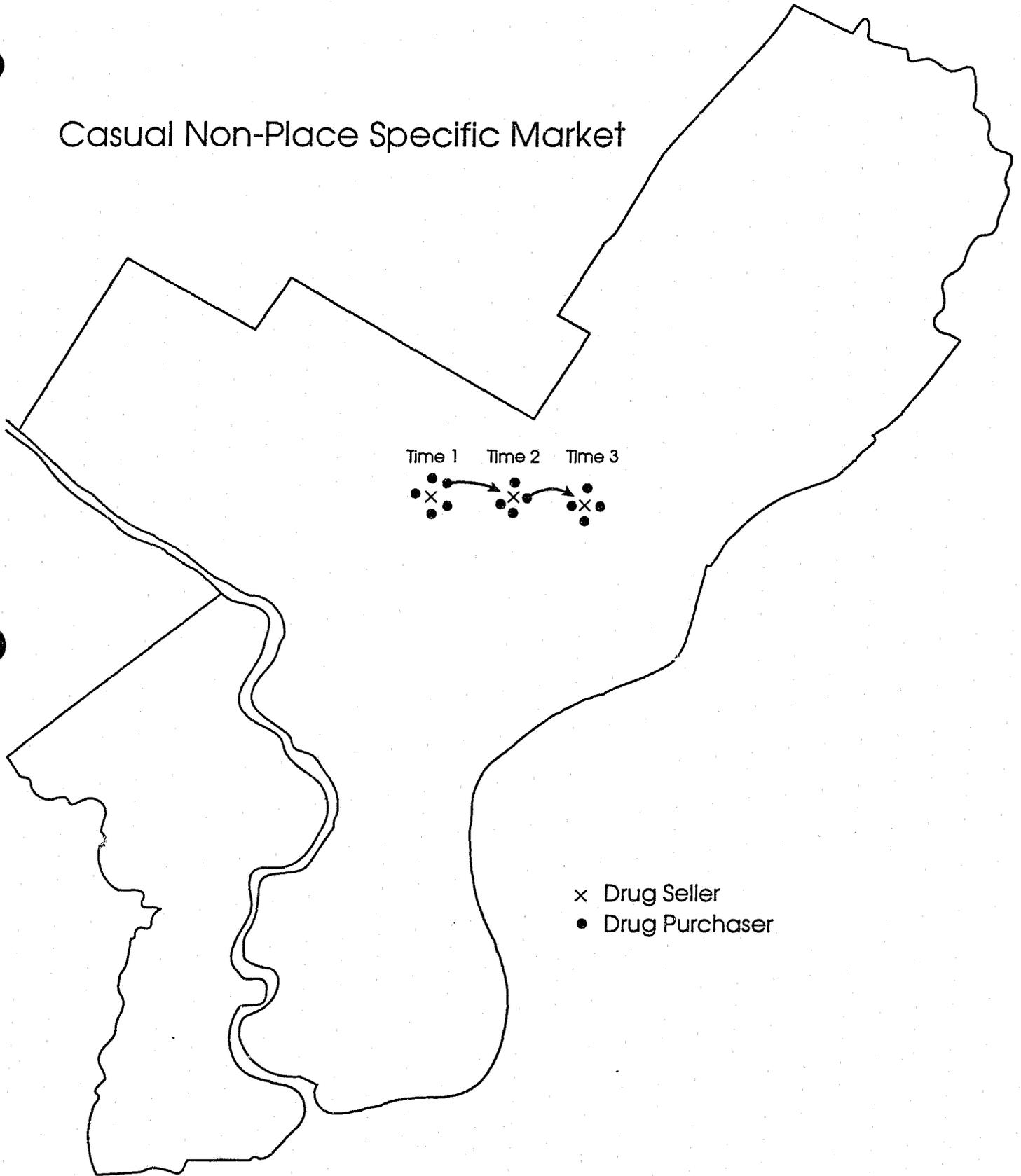
The spatial configuration of this stage varies from place to place and from time to time. Also, the supplier may vary from person to person. There is no dependable source and no advertising. Property crime is not directly related to this drug distribution stage. It may be illustrated by temporary agglomerations of youth at parties and hangouts as follows in Figure 8. Notice that the drug distributor and the place of distribution changes in each time period. There is no threshold or range of drug sales at this stage. Drug distribution may be a more or less chance occurrence.

Stage 2: Periodic Market

At stage two, a periodic market may be established as a local entrepreneur takes advantage of a small local demand for drugs and sells them at specific times at specific places. The supplier may be a regular at a local bar who always has drugs to sell when he is there. Word of mouth advertising spreads the market as friends are introduced to

FIGURE 8

Casual Non-Place Specific Market



Time 1 Time 2 Time 3

× Drug Seller
● Drug Purchaser

the supplier. A dependable supplier may also operate around local schools during lunch hour or after school. Since advertising is by word of mouth, customers are largely local residents of the area. However, property crime may begin as users become dependant and must find a means to support their emerging drug habit. Much of this crime may be stealing from parents, friends and a few local burglaries and shop lifting. The spatial configuration is illustrated in Figure 9.

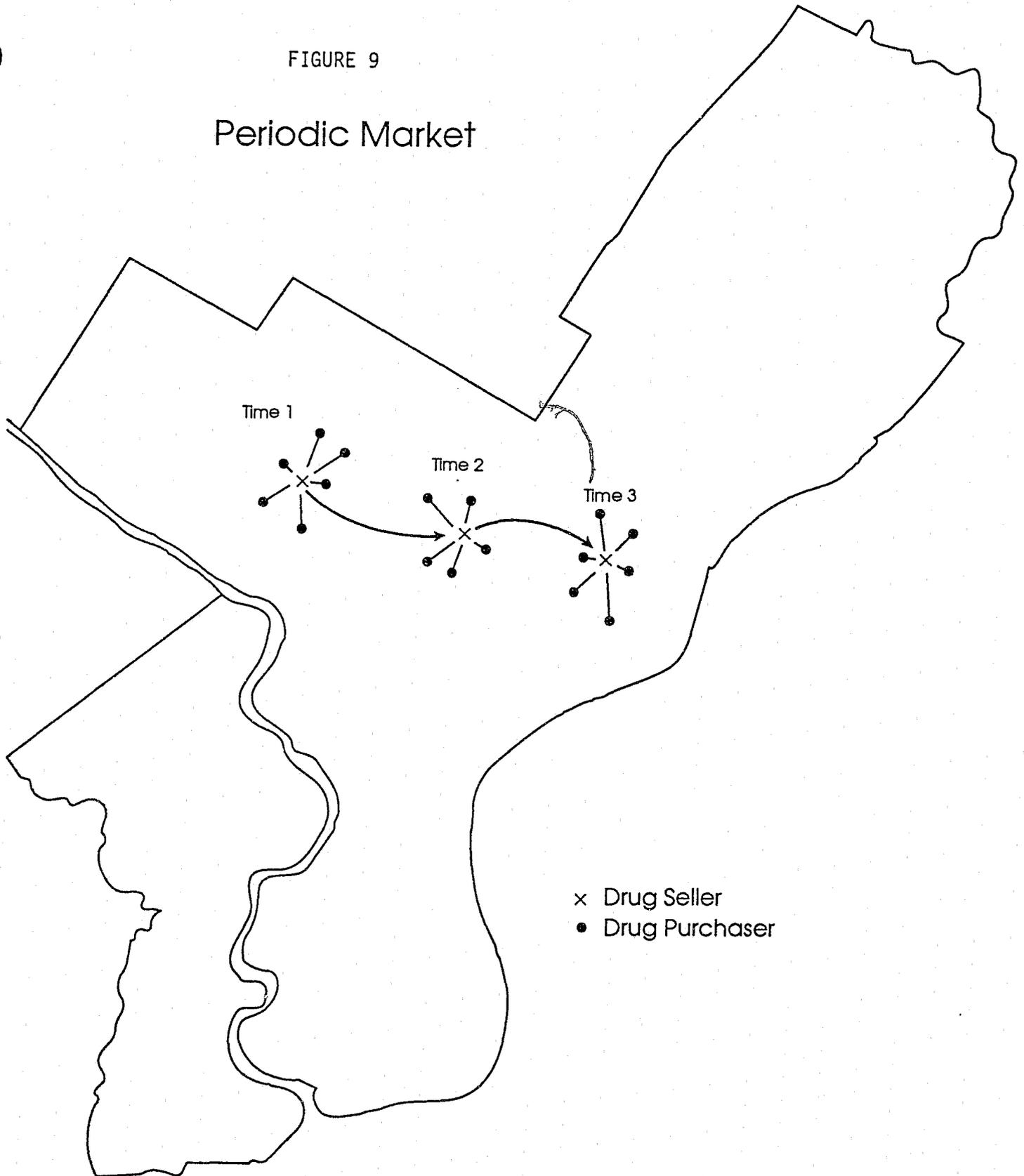
Note that the buyers now travel short distances to a location to purchase drugs or the supplier regularly travels to the customers who are mainly local youths. The range of drug purchases is very short distances. Most travel by foot. Market demand, or threshold, is not yet strong enough to support a full time seller at a permanent location.

Stage 3: Fixed Location Neighborhood Sales

At this stage, the market demand for drugs in the region is great enough to support a full time supplier at a specific location. A specific location is occupied most of the time and becomes known locally as the place to purchase drugs. The supplier must choose a location whose nearest residents are disorganized enough to not know, not care, or feel helpless to confront the drug supplier who is operating in their neighborhood. This is generally a crack house or

FIGURE 9

Periodic Market



shooting gallery in a deteriorating neighborhood along a transportation artery dominated by rental housing, industry, or an uncontrolled local park.

Now the buyer must make his or her way to the drug seller to purchase drugs. In other words, the drug sales location operates as an anchor point in the day to day activities of the drug addict. Those addicts with expensive habits must resort to property crime, prostitution, or other illegal activities to support their habits.

As illustrated by our research on the spatial clustering of burglaries about drug sales areas, property crime is expected to expand greatly in the vicinity of the drug supplier as more and more users become dependent and seek means to support their addiction. This crime focuses on the neighborhoods immediately surrounding the drug seller, as demonstrated in the previous section. Stable community residents in the surrounding neighborhoods will sense the deterioration of their local area. In fact, Taub, Taylor and Dunham (1984) found the existence of drug sales to be the most important determinant of neighborhood satisfaction in Chicago. Many will personally experience a residential burglary or street crime. They may decide to stay and fight back with increased community organization, block watches, and increased demands for police services. They also may harden their properties with alarms, bars on windows, and

increased security especially at entry points of previous burglaries. In most cases, however, they will adopt a "bunker mentality". They will decrease their outside activities as the local streets become less safe. They will especially limit to the barest minimum their young children's use of outside spaces. The neighborhood will become a much less satisfactory place for family life.

Many of the family oriented residents will become dissatisfied with the community because of the deterioration in the quality of the neighborhood for family living. They will seek a safer environment in which to raise their families. Those who are financially able may move to a less crime ridden neighborhood. This leaves some abandoned homes as residents leave faster than they are able to sell their homes. Prospective home owners are reluctant to purchase homes in high crime neighborhoods. This also reduces the remaining neighbors ability to resist drug distributors and crime as the more stable members of the community move out.

As the neighborhood's ability to resist the activities of drug distributors and the associated property criminals decreases with the out migration of stable community members, an opportunity is created for drug distributors to expand the spatial base of their activities. As the area becomes known as a source of illegal drugs, the profits from sales expands greatly. The original seller may add

additional sellers on neighboring streets. Competing sellers also will enter the market as close spatially as possible to the original seller. This is because buyers from surrounding neighborhoods focus on the original location for drug supplies.

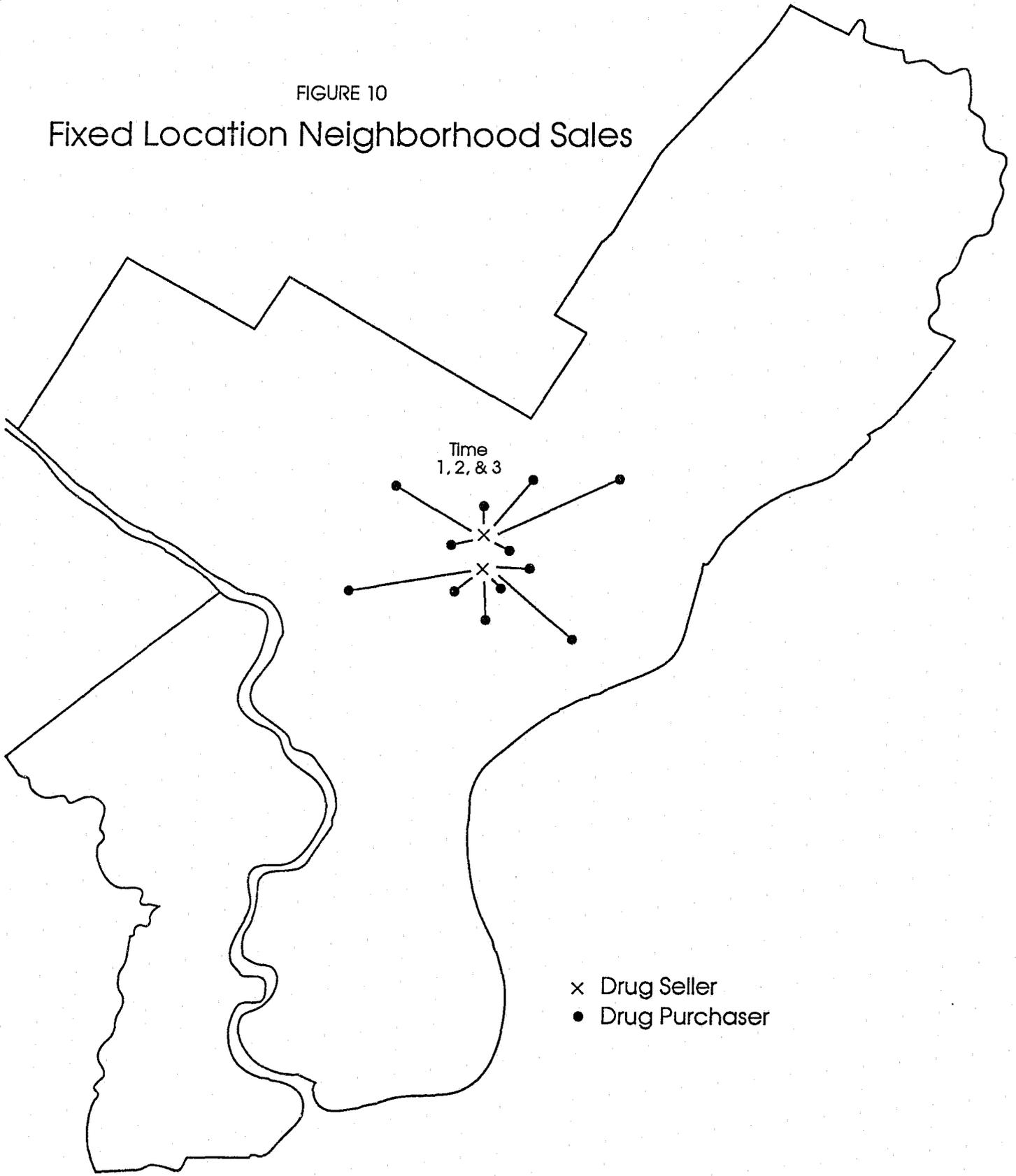
The spatial configuration of drug sales in this case is illustrated in Figure 10. More than one supplier will now operate from the same neighborhood though not from the same location during most hours of the day. Advertising will still be largely by word of mouth. Most drug buyers will come to the location on foot or by public transportation. The threshold and range of sales has increased over the "periodic market" stage. Volume of sales are now great enough to keep a full time drug seller at a specific location and competing sellers may begin to establish themselves in the neighborhood. Crime will focus on this area to such an extent that it will verge on being a persistent high crime area (Schuerman and Kobrin, 1986).

Stage 4: Drug Mart (or Open Street Sales of Drugs)

The cycle of drugs-crime, crime-drugs continues. As more customers focus on the area as a source of supply, profits expand greatly. This encourages competing sellers to set up shop on the edge of the original drug seller's area in the same neighborhood to siphon off some of the excess

FIGURE 10

Fixed Location Neighborhood Sales



x Drug Seller
• Drug Purchaser

profits. Property crime including burglary is now so common in the area that few or no opportunities for burglary remain in the area immediately surrounding the original seller. This area has been "fished out". Residents still living in the area have bars on their doors and windows, dogs, or are nearly always at home. Other homes are abandoned and stripped of valuables, even the copper pipe. Burglars in this area are now displaced into violent street crime such as purse snatching, mugging and drug theft. There are few if any burglary opportunities remaining.

The social fabric of this community has now been nearly destroyed. There are few residents remaining who feel empowered to resist the drug marketers. This allows the drug sellers to operate more openly. Many will commence selling from the street corners rather than from inside establishments. The range of sales (distance customers come to buy drugs) expands markedly as buyers no longer must be familiar with the neighborhood (or the local habits of the supplier -- where he will be and when) to purchase drugs. Buyers do not even have to enter a local bar or crack house (or even leave their cars) to purchase drugs. They just make their way to the supplier's location and make their wishes known. Word of mouth advertising expands the range of sales as customers come from surrounding communities to purchase drugs.

Residential burglary now focuses on the zone surrounding the exhausted "fished out" area. This surrounding area also begins to lose community residents who can afford and want to leave. This leads to community disorganization in a new area which reduces the neighbors ability to resist the establishment of competing drug sellers who expand into their neighborhoods.

This situation of destabilization and disorganization of stable communities through the drug-crime, crime-drug cycle and its spread probably exists in many parts of the Philadelphia metropolitan area, and in every other metropolitan area in the United States.

The next step in the evolution of the drug market place requires a change in how the availability of drugs is advertised. In the previous stages advertising is by word of mouth because legal media outlets are not available to sellers of illegal drugs. However, as the area becomes known as a notorious drug sales area, the human depravity of the addicts and sellers and the human suffering of the remaining residents becomes suitable fodder for print and electronic media seeking sensational stories. The resulting news coverage becomes free advertising that saturates the media market.

Reporters are sent into the area and file stories not only describing the exact location of the drug supplies, but also exactly how a stranger can purchase drugs at that location. Stories often include means of quality control: the knowledgeable customers generally purchase "yellow tape" cocaine which is sold by the largest distributor in the area. TV spots illustrate how you can drive up, roll down your window and bargain for drugs (Sills, 1989). The importance of this "advertisement" is that non local, often suburban buyers now know where to go and how to purchase drugs. Long distance buyers (from the fringes of the media market) now frequent the area creating additional customers and profits for sellers. This increases competition among sellers as they establish new locations on the main routes into the neighborhood to be the first to attract the long distance buyers. Most media stories include some mention about how ineffectual the police are, or how no matter what the police do it is business as usual within one hour of the arrests (Sills, 1989).

This is why this stage is termed a "drug mart". It has economic properties in common with automobile malls which enjoy agglomeration economies as customers focus on a single area. Both rely on advertising to draw customers from outside their immediate area. The range of drug sales now increases markedly as many buyers now travel to the area by automobile. Threshold conditions are so large in this stage

that many full time competing sellers now operate from the same neighborhood. The spatial configuration now appears as in Figure 11.

Sellers will attempt to be as close as possible to the "advertised" area but not so close as to create conflict with an existing drug seller. Geographers identify hexagonal sales areas around suppliers; spatial agglomeration may distort this pattern somewhat as many sellers act as a similar supply point much as agglomeration works for auto sales regions.

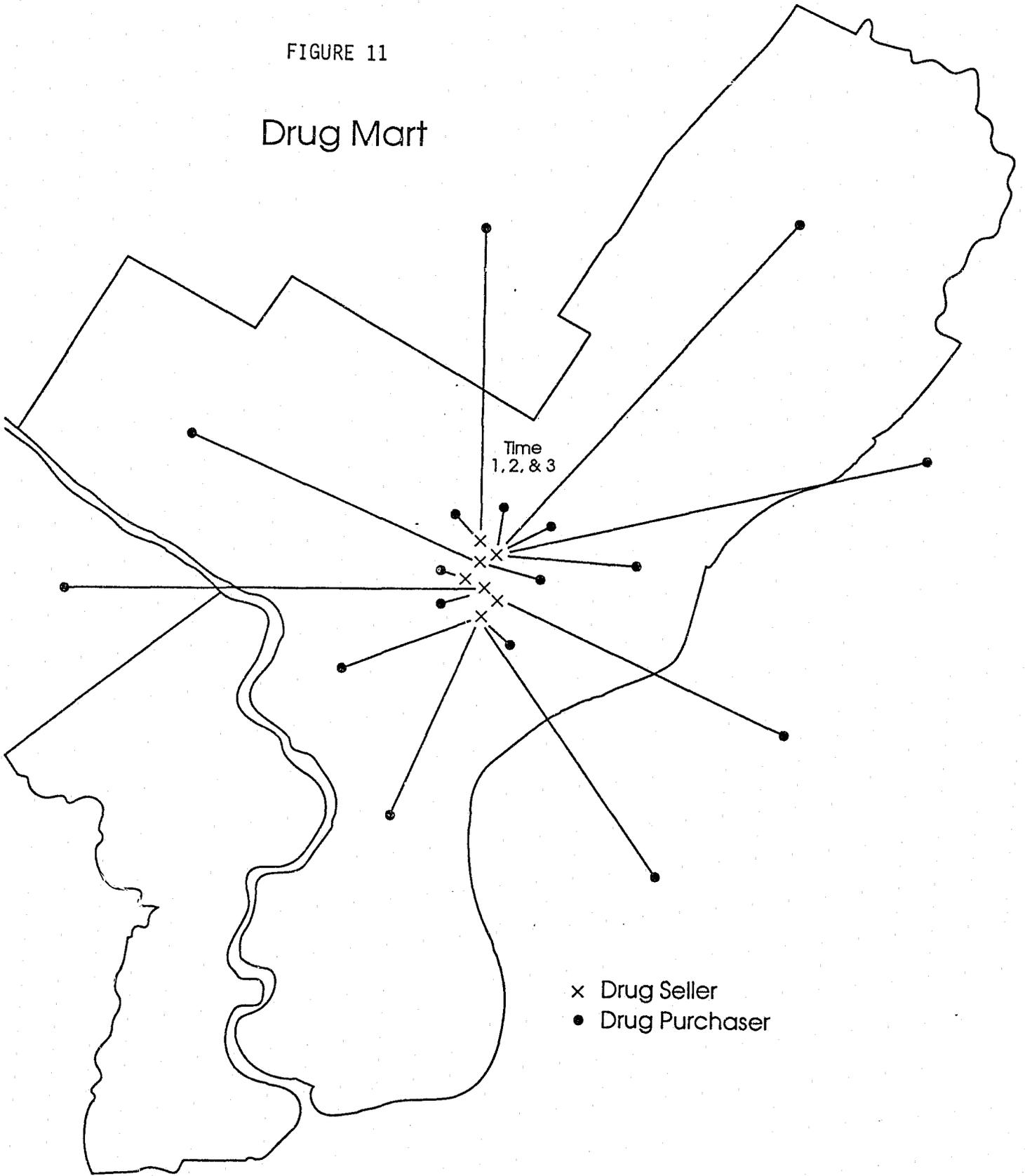
The drug sales region therefore expands out in a contagious fashion as new sellers establish themselves as close as possible to existing sellers. Burglary and street crime open up new areas and make it possible to sell in previously stable communities that would have resisted drug sellers before property crime forced stable members to relocate spatially. In other words, property crime may act as the vanguard for drug sellers.

Empirical Evidence to Support the Model

We demonstrated in the previous sections the marked spatial influence drug sales areas have on the distribution of burglaries by drug users. Ethnographic studies such as ours are necessarily limited in scope due to time and

FIGURE 11

Drug Mart



funding. They do however, offer an excellent point of departure for broader discussion of the issues raised by the behavior of the burglars we came to know.

For instance, we can ask "what if" questions. What if there were ten, twenty or fifty burglars out there who behaved spatially like our drug dependent burglars. And, what if they all focused their crime on a single drug supply location like any one of our urban drug dependant burglars. Since we estimated the parameters describing the spatial patterns of burglary for our drug dependant burglars, we can answer this question by simulating any number of additional burglars who focus their crime on a single drug supply area. Such a simulation will illustrate the potential impact of a drug sales area on neighborhood viability in the surrounding communities.

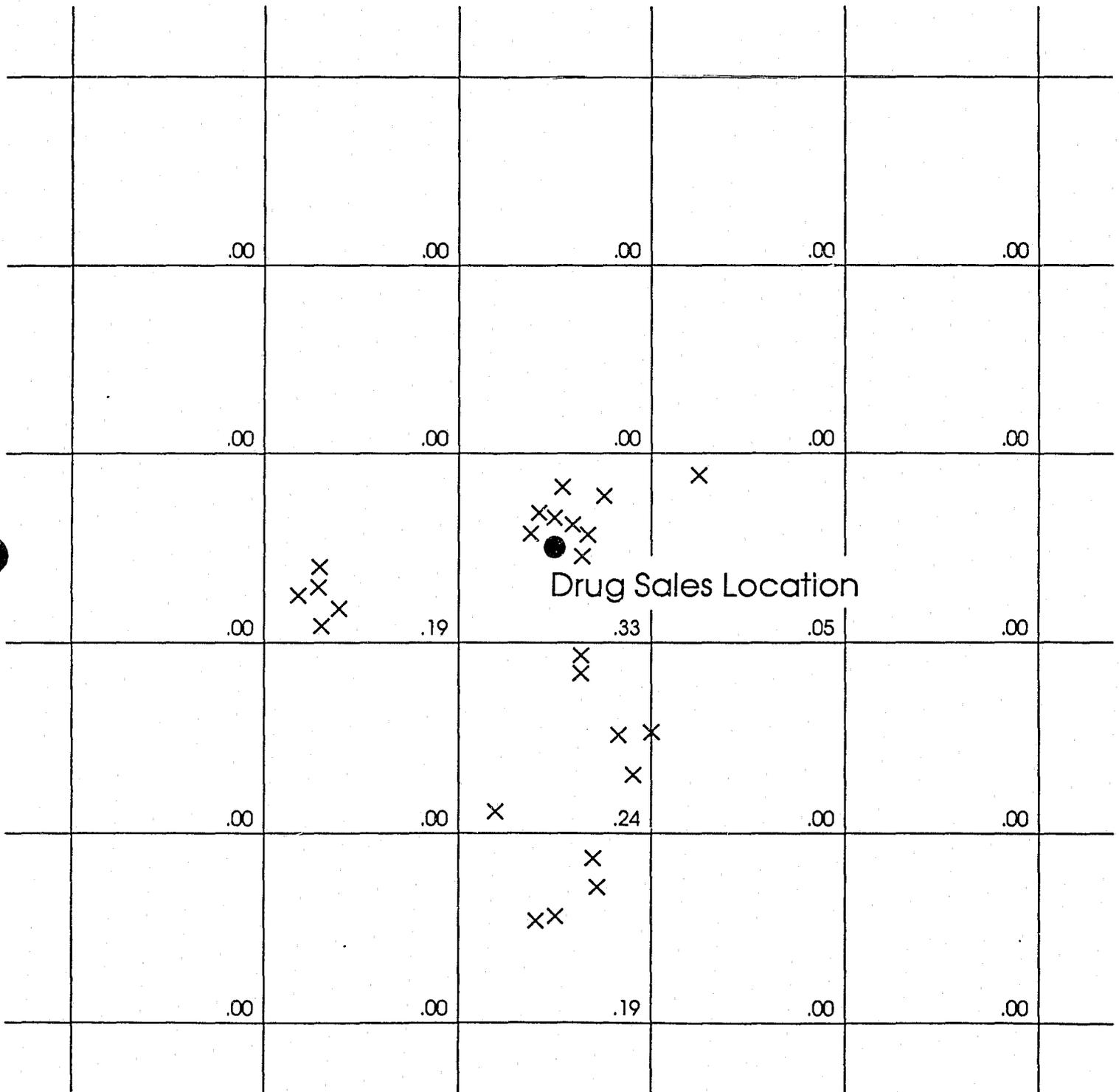
Two approaches are used. First, we examine the potential impact if all the crimes we have knowledge of for our drug dependant urban informants were focused on a single drug supply location, instead of the many that actually were used by the various burglars. Next, we will take a single case and simulate ten, twenty or fifty similar burglars coming from different directions, but all using the same drug supply location.

The simulations use two methods. In the first case, a five by five grid is constructed and scaled to the longest distance any of our drug dependant urban burglars traveled from the crime site to the drug supply location. The grid is centered on the drug supply location of each burglar and their burglary sites are recorded on the movable grid -- the distance and direction of the burglary from the drug supply site. Each cell is 4500 feet on a side or about five city blocks. The top of the grid is placed toward the center of the city. Figure 12 illustrates the resulting pattern. Notice the concentration of burglaries near the drug supply area. Also note that this illustration uses only a small proportion of the burglaries actually committed by these individuals. For example, Burglar Y who is twenty-seven years old claims to have committed hundreds of burglaries in this area over his long career of drug dependency. He has returned to the same homes several time. One of the present authors lived in his territory for thirteen years and was burglarized five times.

The numbers in the lower right corner of each square in Figure 12 refer to the proportion of all the burglaries mapped on the figure which occurred in this square. Geographers refer to these figures as the "mean burglary field" of our drug dependent residential burglars (Gould, 1975). Notice that a third of all the burglaries occurred within about two and a half blocks of the drug sales

FIGURE 12
 Orientation of Burglaries
 Toward Drug Sales Location

CBD



Suburbs

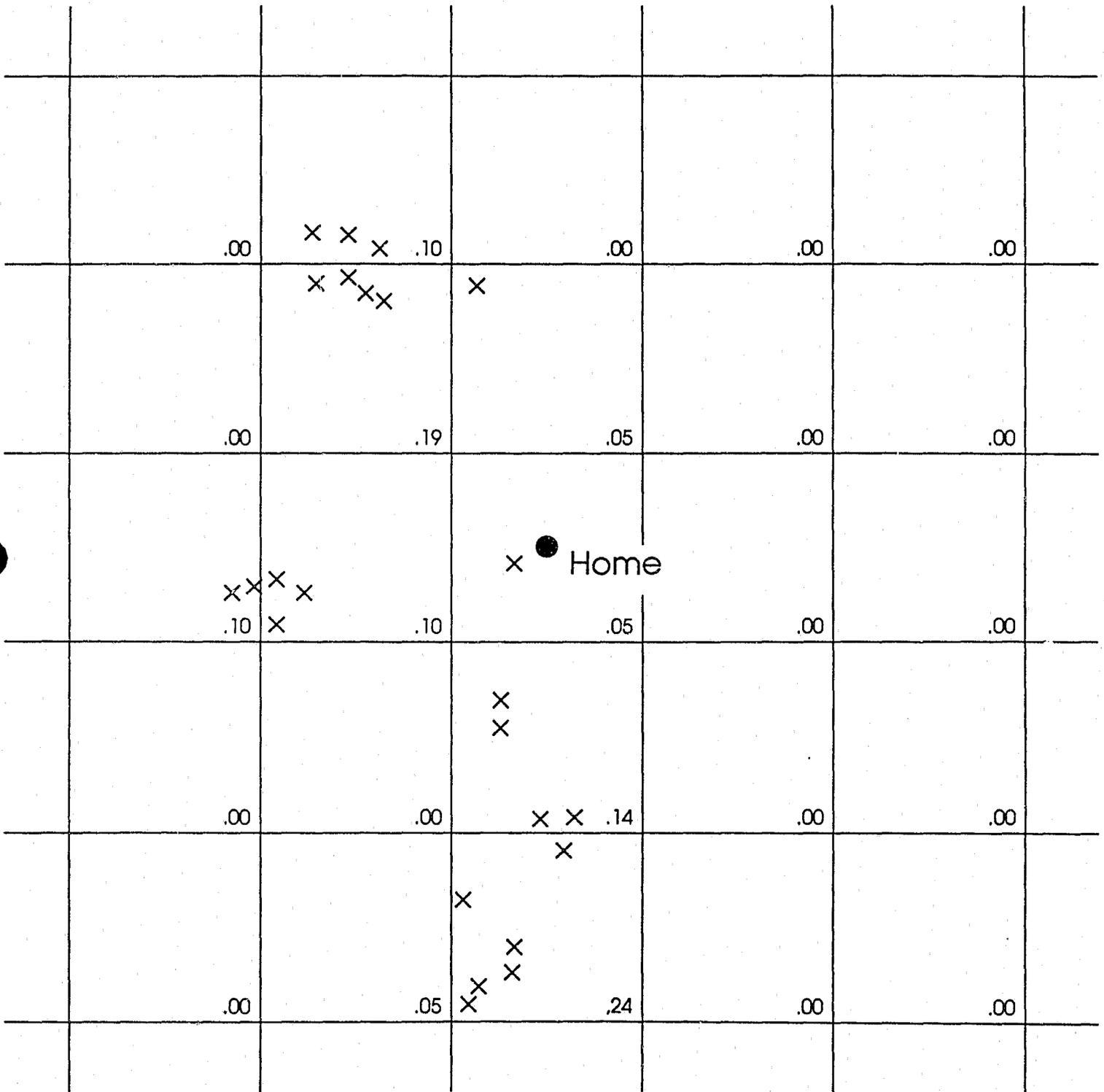
location (each square is five blocks wide). For those burglaries which did not occur in this center square, the directional bias seems to be toward the suburbs. Twenty four percent of the burglaries occurred in the next square toward the suburbs (about five more blocks) and nineteen percent in the next square out toward the suburbs. No burglaries occurred in the square toward the center of the city adjacent to the drug sales square. If we can assume that the city is generally structured with more expensive homes toward the suburbs and less expensive homes toward the center of the city from the drug sales location, the burglars seem to be concentrating their crimes in the more expensive homes which perhaps have experienced less crime in the past than the less expensive home toward the center of the city.

Figure 13 is the situation when the graph is centered on the home of the drug dependent burglars in Philadelphia, the top oriented toward the center of the city and the locations of their burglaries plotted. Notice that only one burglary took place in the same square that the burglars live in. Notice also that there is not the pronounced directional bias toward the suburbs as when the graph was centered on the drug sales location in Figure 12. The burglary sites are much less clustered about the home than they are about the drug sales location and directional bias toward or away from the center of the city is less evident.

FIGURE 13

Orientation of Burglaries About the Home of the Burglar

CBD



Each square is approximately 5 city blocks wide

Suburbs

These findings lead us to conclude that future research should focus on the degree to which drug sales locations localize property crime to verify these tenuous findings.

If ten, twenty, or fifty burglars behaved like the drug dependant burglars in our study, the impact on the residential areas surrounding the drug sales locations would be severe. Some idea of this impact can be obtained by simulating the spatial pattern of burglaries of a burglar in our study using his distance decay parameter with no directional bias. In other words, we ask what the impact on the surrounding environment would be if several residential burglars coming from a variety of directions focused their burglaries about the drug sales location like Burglar Y (Figure 14). Each number represents the burglaries which are expected to occur within three city blocks square in each direction from the drug sales area. Notice the tremendous impact this situation would have on the six square blocks centered about the drug sales location (the four central numbers). Needless to say, these neighborhoods could not sustain the experience simulated here for very long.

The method used to construct the second simulation is as follows. We ignore the direction from which the burglar committed his burglaries. We concentrate instead on the pattern that results if the burglars come from a variety (random distribution) of directions, but experience the

distance bias of Burglar Y. We construct a twenty by twenty grid with the height and width equal to the longest distance a drug dependent burglar committed a burglary from the drug sales area. The grid is divided into eight sectors. Each cell in each sector is assigned a sequential number between zero and one beginning at the center of the grid. Therefore, if we randomly choose one of the sectors, and select a random number between zero and one, each cell in the sector has an equal probability of being chosen. However, if the random number is transformed by multiplying it by the exponential function whose parameter has been determined using logit analysis and maximum likelihood methods of the actual distribution of burglaries about the drug supply location of Burglar Y, we can simulate the distance bias by selecting the cell which contains the transformed number.

Figure 15 is the situation if only twenty burglaries were committed. Figure 14 is the patterns of burglaries that would result if several burglars behaved spatially as did Burglar Y and committed four hundred burglaries.

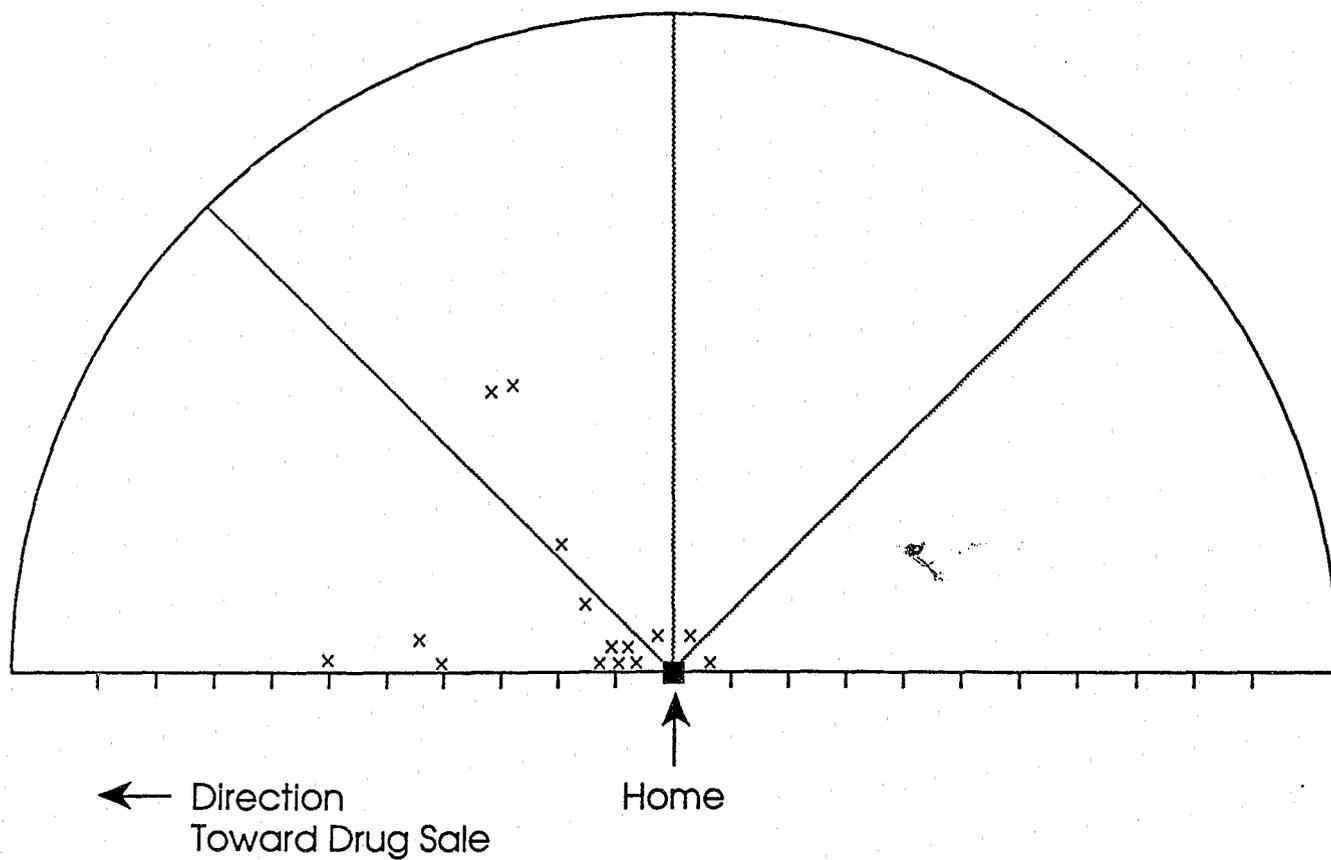
This latter simulation is based solely on the spatial behavior of one individual. The previous simulation is based on the behavior of three drug dependent urban burglars. An obvious question concerns how representative these burglars are of others in Philadelphia. Our next step was to determine whether these findings were consistent with field observations of criminal justice practitioners. Inspector

Edward McLaughlin, Commanding Officer of the Southern Police Division of Philadelphia was interviewed to gain his insights on the spatial relationships of drug sales locations on the localization of property crime in the immediate area. He stated that the above findings were consistent with his experience in south Philadelphia. He also provided us with data on the most used drug distribution location in south Philadelphia. This data included the home addresses, the crime location, and the drug distribution location of all property criminals arrested in the four police sectors surrounding the drug sales location in 1989.

When a protractor was centered on the home of residential burglars and the zero axis set toward the drug sales location, the pattern identified in this study was repeated. (Figure 16). Only two burglars travelled in the opposite direction of the drug sales location (and these were very close to the homes of the burglars). Thirteen burglars travelled toward the drug sales location to locate their burglary sites. If we divide the area into four quarters of forty-five degrees each, we find that fifty-six percent of the burglars located their crime sites in the quarter toward the drug distribution site, thirty-one percent in the next quarter toward the drug distribution site, and only six percent in each of the two quarters in the opposite direction from the drug distribution site. Figure 17 illustrates the case for property theft of fifty

FIGURE 16

Burglary Locations Mapped on the Home to Drug Sales Axis



dollars or more. Although less clustered, all but one are in the direction of the drug sales location. Clearly, drug sales locations serve as anchor points which cluster property crime in the surrounding neighborhoods.

Policy Implications

Can the neighborhoods used as drug marts by drug distributors be saved? Some say no. Several prominent criminal justice scholars argue that we should "write off" these neighborhoods in a containment policy. This is a form of urban triage. For example, Schuerman and Kobrin (1986 p. 98) state:

A number of implications for crime control policy are suggested by these findings. The point of intervention of probable maximum payoff for crime control is in the emerging high-crime areas.... Any neighborhood that has had a high level of crime over a period of several decades may be considered "lost" territory for purposes of effective crime reduction.

Concerning the allocation of police foot patrols, Wilson and Kelling (1982 p. 38) write:

Some neighborhoods are so demoralized and crime ridden as to make foot patrol useless; the best the police can do with limited resources is to respond to the enormous number of calls for service. Other

neighborhoods are so stable and serene as to make foot patrol unnecessary. The key is to identify neighborhoods at the tipping point....

If the popular press is to be believed, some police officers do not even answer certain calls for service in some high crime areas of the city. Writing in U.S. News and World Report, Thomas Moore (1989) reports:

Like MASH units in war, overburdened war-zone police districts apply triage to crime reports, focusing mainly on murders and shootings and ignoring burglaries. Implicitly, if not explicitly, many have adopted a policy of crime containment rather than prevention. "Why not let the bozos shoot it out, then go in, pick up the bodies and arrest the winners?" says Cleveland Detective Doug Charney.

Notice that containment strategy allows the energy driving the diffusion process to expand unimpeded. The energy in drug sales is the profits from an expanded drug market. The vanguard for an expanding drug market is the property criminals who exploit the "tipping point" communities surrounding the high crime drug sales area. If the high crime drug sales area is not attacked directly, it will continue to generate criminals until the "tipping point" communities become persistent high crime areas. The high crime area will diffuse out spatially and the

containment area will have to enlarge until it encompasses whole sections of our inner cities.

Practicing a "containment policy" against drugs by ignoring neighborhoods where policing is difficult is a losing strategy for police and for the community as a whole. The containment policy, quite simply does not work. In the preceding sections we illustrated why containment does not work in the long run. Even when drug sales are contained within a well-defined area, property crime will spill over into surrounding communities paving the way for the eventual expansion of drug trade into these areas as well.

Policing becomes more difficult in neighborhoods that are losing their most stable citizens because of the flight from property crime. The property crime spill over from drug sales areas is one means of discouraging law abiding citizens from living around containment areas.

This was clearly apparent in Philadelphia where our drug dependent informants articulately described how they would initiate their activities at a local drug sales area. For Burglar E, for example, this area was a bar where drugs are sold located in a bad area of Lansdowne Avenue locally called "the strip". It was an area for both drug supply and fencing stolen property. He would go to the bar to "hook up with friends" and plan the day. One thing was for sure

"Don't do nothin' in the ghetto," that included the bar and the immediate neighborhood. This area was fished out and the remaining residents hostile. Instead, they would make plans to go to the nearby Overbrook section because "it close and the people got enough to make it worth while." This was his preference. He was also active in another area he described as lower Wynnefield. While this area was not as affluent as the portion of Overbrook he exploited, it is a stable middle class community. His activities and the activities of others that emanated from the strip are well along the way to destabilizing both of these Philadelphia neighborhoods and making them ripe for the spatial expansion of drug activity. Containment fails as both a means of fighting crime and of protecting those outside the contained area.

The discussion of the evolution of a drug sales area, its effect on the spatial distribution of crime, our field data and the simulations based on it, all suggest that drug sales areas really are market places with many of the same economic characteristics of legitimate markets. An alternative to containment may be to attack some of the market and economic forces at work to disrupt and weaken the drug market.

Larry Sherman (1989) argues we should practice "hot spots" policing. Hot spots are defined as locations which generate a disproportionate number of calls for service to

the police. However, once the social fabric of a neighborhood has been destroyed by the property crime associated with a drug sales area, the remaining residents are not likely to have faith in the police to solve their crime problems. These neighborhoods are not the ones which are likely to generate calls for service to the police. Keep in mind that much of the remaining crime is against drug users in drug marts -- not the kind of victim who is likely to rely on the police for aid. Hot spots are more likely to be crime infested bars, retail establishments, or residential areas at the tipping point which still rely on the police to solve their problems.

An effective if difficult first step is to attack drug sellers in the center of their sales area even if this is difficult without community cooperation. The argument against this policy is that the sellers will just be displaced spatially to a neighboring community. However, the neighboring communities may not be so hospitable or as profitable a location. If enough police manpower can be mustered to displace the sellers out of the disorganized communities, they will have much more difficulty establishing themselves in stable communities (Jerdan, 1987). Stable community residents can be prepared for this eventuality and taught methods of cooperation with police to fight the influx of drug dealers.

Reuben Greenberg, Chief of Police in Charlestown, South Carolina, who because of his success is on loan to Mobile, Alabama, practices just such an approach. His tactics are targeted on the poorest of the poor -- the residents of public housing projects that are often ignored by other police departments. These also are exactly the areas formerly written off by criminal justice experts and practitioners. As stated by Greenberg, "The police force had written off whole sections of town to the criminal element. The attitude was 'Let 'em have it, as long as we stay out of there,'" (Smith, 1990). Greenberg's tactics include the reestablishment of foot patrols in the ghetto and the organization of "flying squads" also called "jaguars" to chase down street corner crack dealers in drug marts. His goal is to disrupt the crucial connection between street dealers and their customers. These are the drug marts mentioned above. Greenberg trains his police officers to be highly visible, confronting both sellers and buyers. Smith (1990) noted, "On a recent evening, a jaguar team car was stationed directly in front of a reputed crack house to scare off customers. 'You do that three or four times a week and your going to run the business off,' Jaguar Officer Jack Bishop said."

We must keep in mind that potential locations of drug sales are not omnipresent. One might ask if a drug seller is likely to be successful on the block where you live.

cooperation in their war on drugs. It certainly will make the street sellers less accessible and therefore, less profitable.

Again, this recommendation runs counter to suggestions made by criminal justice scholars in the past. For example, Newman (1973) recommends:

"....(residential areas) must be made secure, even at the expense, if necessary, of making other nonresidential areas more dangerous. In many ways it would be a significant accomplishment to achieve this end alone: allowing displacement of crime to shopping, institutional, and business areas. The argument can be made that these other areas are inherently more easily served by formal police protection." (Newman, 1973).

We suggest that coproduction of police efforts (community cooperation) may be greater if the problems are not hidden in out of the way shopping, institutional or business areas. We believe that the problems of drug sales and drug abuse are best confronted head on in the neighborhoods where we live. The problem will not go away simply by making it less visible.

The drug user should also begin to pay a higher economic and social cost. Reverse sting operations will make purchasing drugs a much more risky undertaking. Police

operating in high drug sales areas should be trained to legally harass drug buyers to make purchasing drugs as inconvenient as possible. Police morale should not suffer because of revolving door justice if one of the objectives of enforcement is to purposefully keep users occupied at arraignments and arranging for their release. Aggressive use of other, tougher measures will further drive up the cost of consumption. Strict enforcement of laws that allow seizure and confiscation of automobiles of drug users should be standard procedure (Stelwagan, 1985). Such practices will cut down on the range of drug purchasers who must now purchase drugs on foot. This also effects the threshold of drug sales as profits from suburban buyers are no longer available to the drug dealers. These proceedings should be initiated as often as possible instead of being a last resort. The following examples illustrates this point.

Consider the geographic range of drug buyers and their impact on the profit of drug sellers. Three of our burglars from the Wilmington suburbs sometimes drive all the way to areas of Philadelphia to buy drugs. This is not because cocaine, methamphetamine and heroin are not available in New Castle County and Wilmington. When asked why they frequented the specific areas they chose, they mentioned price and availability of their drug of choice in quantity. When asked how they found the area, each described an "asking around" process initiated after "hearing about it" in news media

stories describing a problem area of Philadelphia.

Information about the availability of drugs only made a bad problem worse for these individuals. Each had regular close-by suppliers that fenced goods for both drugs and cash. None needed to go to a Philadelphia neighborhood, but they did. And so do many others as a result of sensational "how to" reporting. The net effect on neighborhoods that draw from so wide an area has not been documented, but is never the less frightening.

Our experience with these informants leads us to a grave concern about how the media participates in community destabilization and the development of a drug sales area or "drug mart" through sensational reporting that becomes advertising for illegal drug sales. Journalists seek the sensational rather than the responsible, and the Constitution guarantees this right.

Local police can utilize the news media as a resource by understanding and playing to the media's motives. The release of arrest reports through press releases may not publicly embarrass local users. However, it will threaten the reputation of many who travel to the area to buy drugs. This is a cost many suburban users who drive to urban drug sales areas will not be willing to pay. The seizure of cars, first hand reporting of the suffering and squalor that accompany drug use and the immediate release of every piece

of information available on arrested drug sellers and users will provide the sensational stories the press seeks. It may also help convey the message that drug sales are no longer a "business as usual" activity.

Negative publicity can eliminate the long distance buyers from the drug market place and eliminate some of the profit. Users would be much more localized. Local communities would have a much better chance of fighting these problems than when their neighborhoods are inundated with non local buyers. We feel that the practice of using proceeds from the seizure of property to fund local police and community anti-drug activities should be expanded and codified to prevent local governments from diverting these funds for other purposes.

Drug sales will spread spatially unless the energy driving drug sales is attacked directly, preferably at the heart of the drug sales area. That energy is the profit from drug sales. The profit comes from users and where possible, users should be nearly as great a law enforcement concern as the sellers -- especially the more affluent users who provide a portion of the drug sales profits from their BMWs.

The real victims of drugs are the law abiding citizens who must try to live through the deterioration of their communities. Too much attention has been focused on the

causes of drug abuse and the user as victim. We should no longer ask those who obey the law to suffer the brutal and dehumanizing effects of life in the drug market place. These are the true victims of drug abuse.

Integrating Time With Space

In the preceding chapter, we outlined the spatial pattern of residential burglary with respect to the burglar's home, and for drug users, to the site where drugs are purchased. This spatial arrangement is commonly portrayed on maps with a two dimensional character. A third dimension -- a vertical dimension, can be added to represent time.

This acknowledges that burglaries are not just simple events that take place only in space, but that they also occur in time. Time is as important a concept in defining opportunities for crime as spatial accessibility. This is because specific sites are opportunities for burglary only at specific times of the day when they are unoccupied or appear to the burglar to be unguarded and vulnerable. Burglaries require that the burglar's schedule and that of the victim coincide to leave the home vulnerable, and that the burglar's spatial search and knowledge lead to that site at the same time. Therefore, opportunities for burglary have both a spatial and temporal dimension.

We can integrate space and time by borrowing concepts developed by Swedish geographers to describe human activity in a formal society. The foundation that underlies these concepts is that every human defines an uninterrupted path

in time-space beginning at birth and ending at death. The life path concept can be further subdivided into a year path, month path, week path and day path.

What is possible for humans to undertake on these life paths is severely restricted by natural and social constraints. Recognizing the existence of these constraints acknowledges that human activity is formed not only by attractions and/or advantages, but also by what is possible and impossible to accomplish due to natural and social barriers to human activity. In criminal justice, these two perspectives may be central to the liberal and conservative views of corrections. The liberal perspective argues for providing advantages to potential criminals associated with legitimate activities so that they will choose socially acceptable behavior. A more conservative view is to constrain or threaten to constrain potential criminals so that they will be unable to violate social norms and laws. There is an ongoing debate in the literature as to which approach is preferable (Cullen and Gilbert, 1982, Von Hirsch, 1976). This study will add to this debate by suggesting an alternative way to conceptualize and evaluate the relative merits of constraints. The primary focus is on the interrelationship of the physical and social characteristics of these constraints.

This interrelationship between social and physical constraints is illustrated by Hagerstrand (1970, p. 11) in an allusion to a popular fictional hero:

"When Robinson Crusoe found himself alone on his island, he could make up his program without regard to a pre-existing socio-economic system. The natural resources were all his to develop under his specific set of biological and technical constraints. An individual who migrates into an established society, either by being born into it or by moving into it from outside, is in a very different position. He will at once find that the set of potentially possible actions is severely restricted by the presence of other people and by a maze of cultural and legal rules. In this way, the life paths become captured within a net of constraints, some of which are imposed by physiological and physical necessities and some imposed by private and common decisions. Constraints can become imposed by society and interact against the will of the individual."

Later in this section, we will make the analogy of criminals as Robinson Crusoe - individuals operating largely outside socially imposed constraints on their behavior, and who in some cases have even altered natural physiological constraints. Before we address the empirical data, let us

develop the concept of constraints a bit further. First, all constraints can be given a physical geographic form in terms of either location in space, areal extension, and/or duration in time. Again, Hagerstrand (1970, p. 11) notes that, "Even a universal rule such as, 'Thou shalt not kill,' means that a set of configurations of paths are not permitted, except in war and in traffic." Therefore, since humans define an uninterrupted path over their lifetimes through space and over time, all human activities can be defined in terms of the use of space and time, and, in terms of constraints on this use of space and time.

Constraints on human behavior are many and varied. It would be impossible to identify each explicitly. It is more useful to talk in terms of categories of constraints. Three large categories have been identified: capability constraints, coupling constraints, and authority constraints (Pred, 1981). Capability constraints limit the activities of the individual because of his or her biological construction, and includes the tools they can command (Hagerstrand, 1970). For example, the biological construction of the human demands that large blocks of time be allocated to the physiological needs of sleeping, eating and personal care. These constraints usually limit the individual to the home domain for large blocks of time. The necessity of sleeping a minimum number of hours and of eating at regular intervals determine the bounds of other

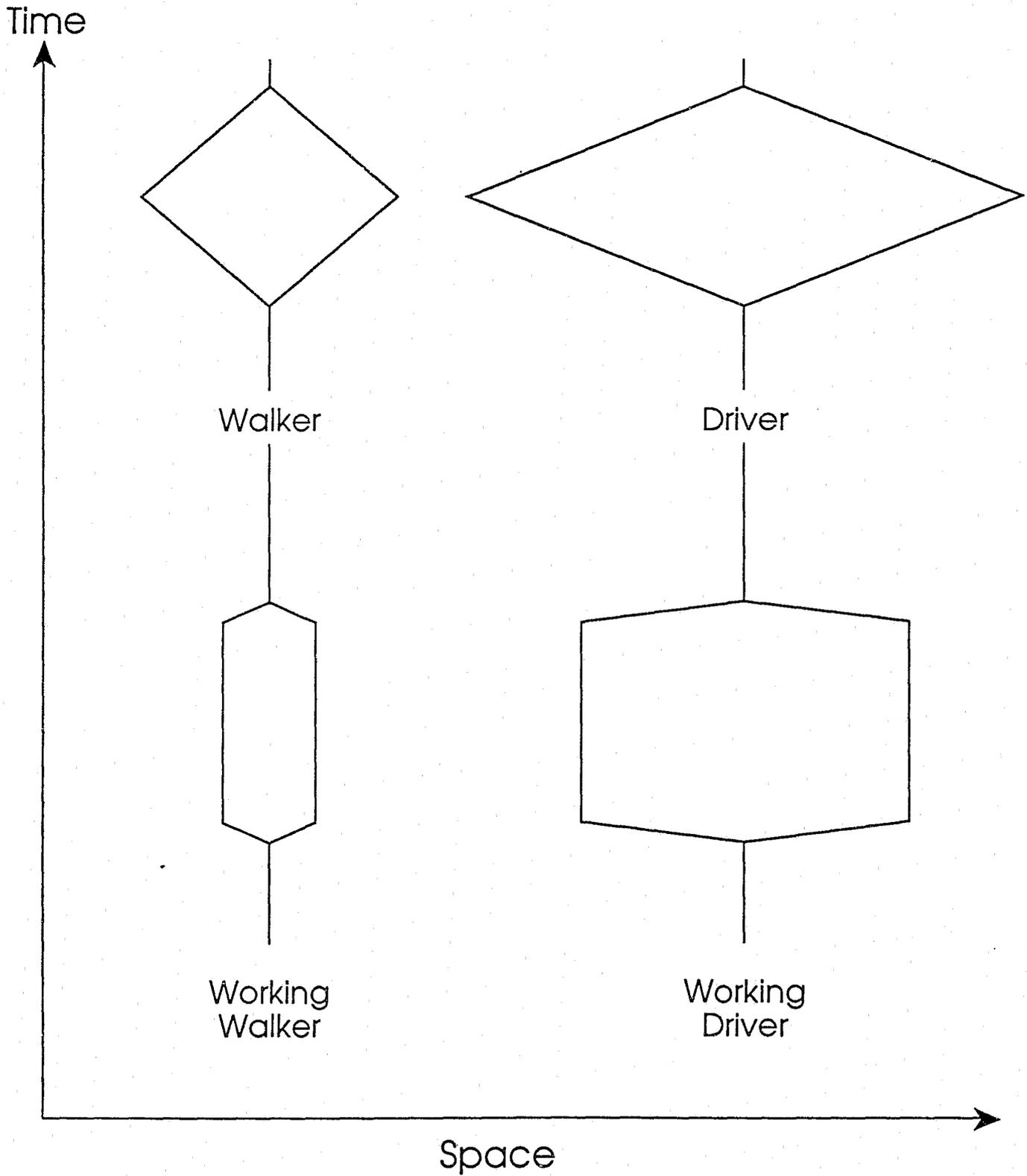
activities which require a continuous time commitment. Time not devoted to these physiological necessities may be available for out of home activities. However, out of home activities that may be selected are constrained by the distance they are located from the home base, the transportation technology available to the individual, and the time available for travelling to the domain of the new activity. This is a time-space meshing which determines the capability of the individual in engaging in a given activity due to its relative location with respect to the home domain.

People need a home base at which they can rest, keep personal belongings, and be contacted by other individuals at acceptable times. This home domain limits how far one can travel spatially if they are to return on a daily basis. One can conceptualize this spatial extent as an island. Everyone lives on an island the extent of which is determined partly by the transportation technology available to them. Figure 16 illustrates the relative size of these islands under different modes of transportation.

The vertical lines depict time spent at one location (such as at work or at home). The slanted lines depict how far an individual can travel in either direction using the modes of transportation available to him. Stated differently, the enclosed area is the space available for

FIGURE 10

Spatial Extent of Personal Island: Daily Possible Use of Space



after Hagerstrand, 1970

their use given the mode of transportation. Note that a person driving a car has much more space available for use than does a person who is on foot. A person can work or commit crimes over a larger area if they have access to an automobile.

Other stops could be added to this figure in addition to a work domain. We might add a restaurant on the way to work, a bar on the way home, etc. Every stop on the space-time path means there is less time available to do alternative activities and less space can be traversed in the remaining time that has now been further reduced by the stop. The spatial extent of our personal island shrinks in proportion to time spent at any given stop along the way. Therefore, time, space, physiological necessities, and transportation technology, define 'capability constraints' with regard to the human activities that are possible and those that are impossible on a daily basis.

The second category of constraint is termed 'coupling constraint.' Coupling constraints define where, when, and for how long, an individual has to join other individuals, tools and materials in order to produce, consume, and transact (Hagerstrand, 1970). Time is the most important element affecting these constraints. When several persons' time-space paths have to converge at a particular place at a particular time to transact an activity, we refer to this

convergence as an 'activity bundle.' Many activity bundles follow predetermined time-tables such as work and school. The individual's choice often is not whether the activity bundle forms or not, but whether or not to join the activity bundle. In other words, the class will be held whether or not a particular student decides to attend. In other cases, an activity bundle depends on the active participation of the individual. An individual who is bound to a home base can participate only in bundles which have both ends inside his daily activity island. Activities have to be located in space so that the individual has time to move from the end of one to the beginning of a following activity. This means that a person can not be a bank robber if he is employed during the business hours of a bank, unless he takes time off from work. A burglar can not work during the day and also burglarize the home of a two career family with out taking time off from work. Therefore, coupling constraints often interact with capability constraints to determine possible human activities.

The final category of constraints is of particular significance in criminal justice. They are 'authority constraints.' Authority constraints are related to individual and social control of access to a spatial domain. Space is the critical element in authority constraints. The purpose of domains is to protect resources (whether individual property or socially defined areas or domains).

Authority constraints take the form of general rules, laws, economic barriers, and power relationships that determine who does or does not have access to specific domains at specific times to do specific things (Pred, 1981). In time and space, domains take the form of cylinders the insides of which are either not accessible at all, or are accessible only upon invitation, or after some kind of payment, ceremony, or fight (Hagerstrand, 1970).

Smaller, less authoritative domains are protected only by custom. For example, when a student leaves open books on a library table to reserve a space while at another part of the library. Larger domains often have strict authoritative rules or laws that protect their legal status. The home is of this nature. A burglar gains access to the home only through use of force to gain entry. Automobiles also are of this nature; car thieves must use force to gain access.

There exists a hierarchy of domains whether defined in terms of legal access and control, or whether defined in spatial extent such as home, neighborhood, city, state and country. Individuals who have access to power in a high level domain may use this power to restrict the set of possible human activities which are permitted of others within this domain. This is the basis of territorial laws which vary from place to place and from time to time.

Authority constraints interact with coupling and capability constraints to limit the range of activity available to individual humans. Some of these interactions are obvious; others are more subtle in their impact on individuals. For example, Hagerstrand (1970) notes that low-income jobs give access to fewer and inferior domains than do higher-income jobs. Low pay translates into inability to purchase or rent expensive dwellings which may be located closer to the domain of employment. This in turn translates into longer commuting time which subtracts time from leisure activities.

Consider the case of an inner city domestic maid employed by a wealthy suburban home owner. Early morning arrival at a train or bus station is common place for this worker who in turn arrives home late in the evening. Hours may be spent in the daily commute. Low-paid help in expensive restaurants in the suburbs experience the same difficulties that impose similar restraints. After working and commuting, little time remains for these individuals to participate in family life or other leisure time activities. Individuals in low-income jobs who cannot afford the expense of automobile ownership also must spend more time commuting to and from a job than do those who can afford an automobile. Therefore, their employment not only pays less, but requires more time for commuting than does higher-income

employment. Employment may require more effort for many low-income persons than is the case for high income individuals.

This conceptual framework can be summed up by noting that from a time-space perspective, we have two diverse systems in interaction. One is the predominantly time-directed orientation of individual life-paths governed primarily by capability and coupling constraints. The other is the more space-oriented set of constraints related to domains and bundles of human activities governed primarily by authority constraints. Social scientists know very little about interactions of constraints, as viewed through the life-path of the individual. We have tended to view people as parts of activities to be performed within each domain in isolation, and not as entities who need to evaluate their paths between and through domains as well (Hagerstrand, 1970).

Let's turn our attention to an examination of the daily and life paths of a group of residential burglars. This examination will help us understand why burglary may be a rational choice given their life situations. It will also help to identify those classes of constraints which most fruitfully might be brought to bear on this illegal activity.

It should be noted from the outset that private or social authority constraints have had very little impact on burglary activity. We have not talked to a residential burglar who has seriously considered who should or should not be victimized in terms of their ability to suffer the financial loss from a Marxist perspective. Their concern for the less fortunate is based on a "why bother" assessment of potential personal gain. What we have determined is how these burglars have fit their crimes into their life-paths and their daily-paths over space and through time to the present. Their major challenge is how to avoid or overcome authority constraints. We begin by examining the day-paths of burglars to illustrate how they fit burglary into their daily lives. We will emphasize how constraints limit the choices they make and how they alter their daily and life-paths to integrate burglary into their lives.

Day-Paths to Crime

When we aggregate the use of time by the fifteen burglars we have worked with, a clear picture emerges of what is possible and what is not possible while employed or while doing crime. Figures 19 to 30 depict the proportion of the fifteen burglars who are engaged in each activity at each hour of the day.

These data derive from two daily diaries we asked each burglar to construct. Each burglar was asked to construct a diary on their most recent crime day and their most recent work day, and to tell us what they were doing from the time they got up (not always in the morning) until they went to sleep at night. The first is the use of time in half hour blocks from the time they get up in the morning or afternoon to when they go back to sleep on the last day when they committed a burglary. The second is a diary of half hour blocks of time for the day when they were last employed at a legitimate job. For each half hour block of time, we have summed the number of burglars engaged in a specific activity. The charts illustrate what proportion of the fifteen burglars were engaged in each activity at each hour of the day. The charts portray seven major daily activities that were suggested by the data. These activities are sleep, eating, tv, partying, shopping, working, and committing a crime. When the activity takes place outside

the home, travel time is added to the activity which follows the travel.

Several important insights into time use can be obtained from these graphs. First of all, we can observe how work and crime impact the distribution of the other activities over time. Secondly, we can observe the proportions of time spent out of the home on other activities while the burglars were employed, and on the day the burglars were engaged in crime. The first obvious point is that few of the burglars worked on the day they committed a burglary, even though some were employed. For those who were employed, most restricted their burglaries to weekend days when they were not required to be at work or to the nighttime.

Past studies have established that full time employment is more likely to effect the amount of leisure time available to the individual than any other class of activities. Of the seven activities considered in this study, watching television or partying are the two purest forms of leisure time activity. When the graphs of work days and crime days are compared for watching television, some clear differences are apparent. On crime days, television watching begins just after noon and by two o'clock, forty percent of the burglars are watching. It gradually falls off, until no one is watching from seven to nine o'clock. A small group watches at nine and ten o'clock. On a working

Figure 19

CRIME DAY: Aggregate Time Used For Television

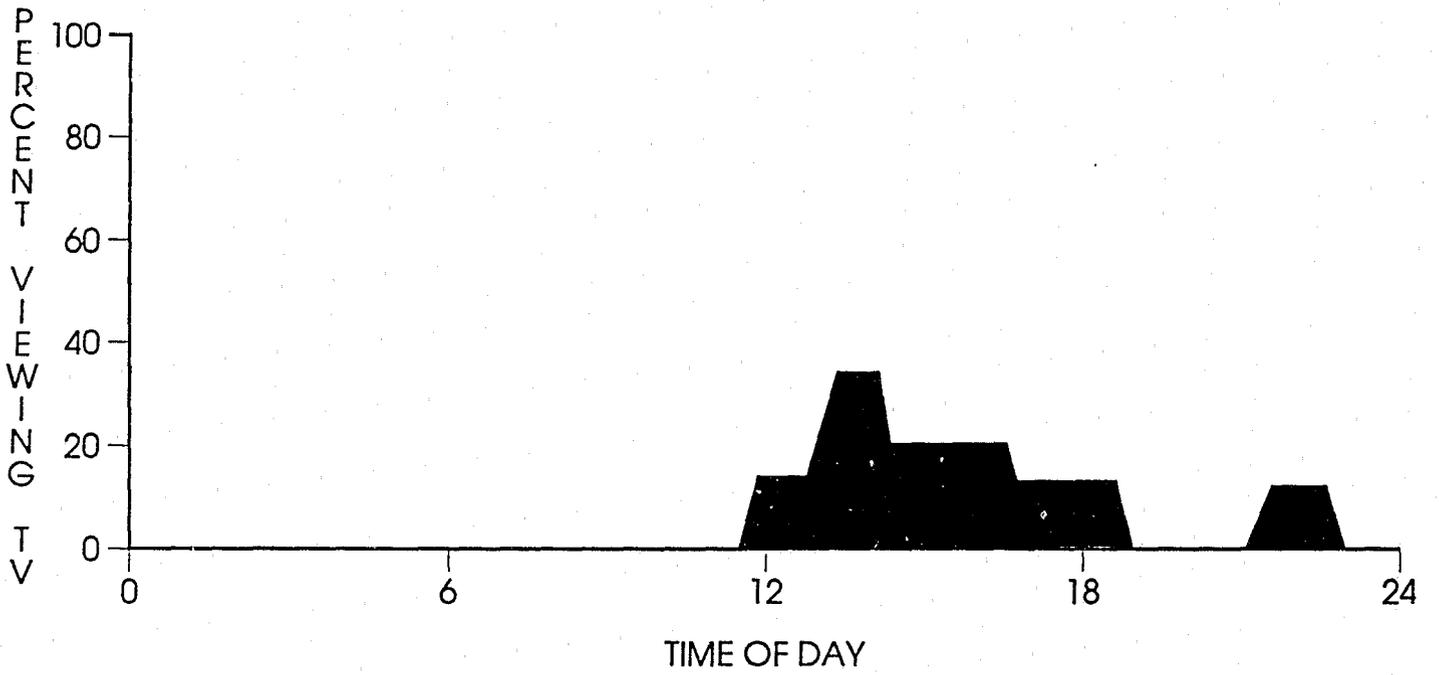
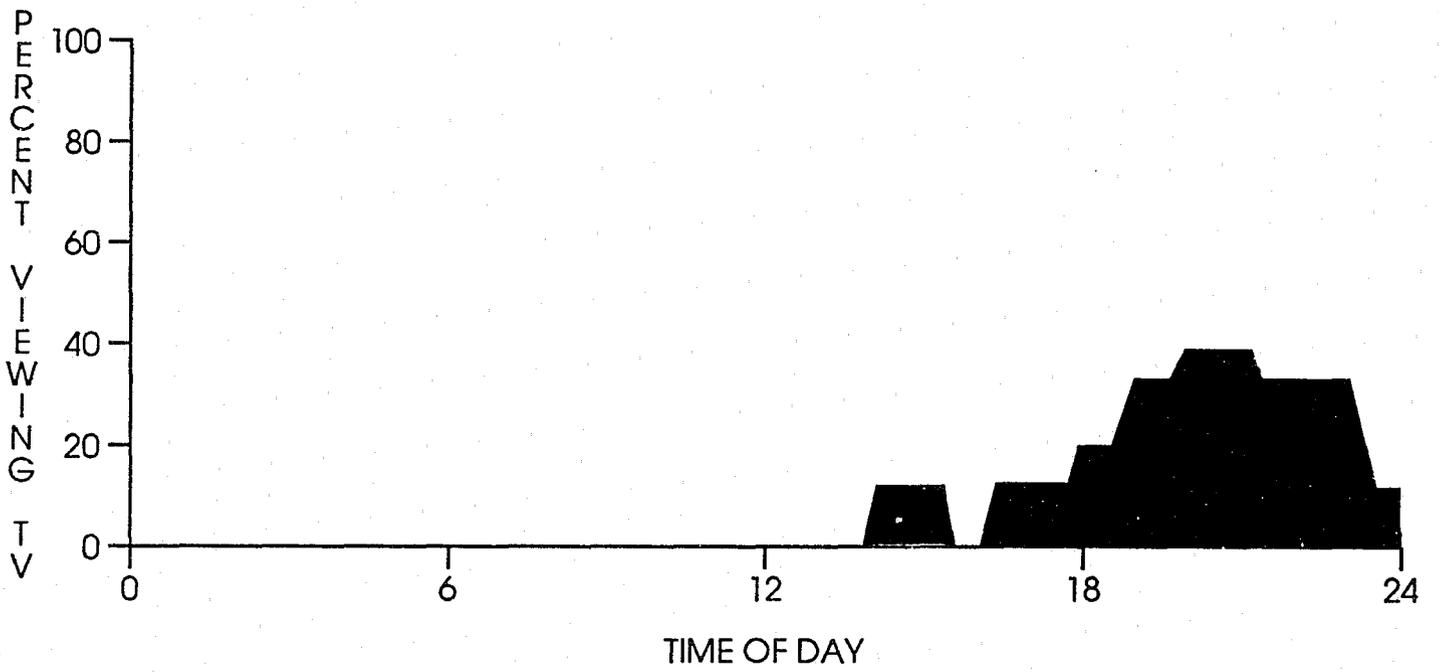


Figure 20

WORK DAY: Aggregate Time Used Watching Television



day, a different pattern emerges. Capability constrains do not allow watching afternoon soap operas while employed on most jobs. Only a few individuals watched at three-thirty and five, after work. Most began watching at eight and nine o'clock at night -- a time when few watched when engaged in burglary.

Even more constrained is partying on a working day. Partying includes a general gathering for doing drugs, drinking, or just "hanging out." On a working day the partying stops by two o'clock in the morning. From two a.m. on begins twelve hours with no partying. Parties do not begin again until after two o'clock, and by eight o'clock, sixty percent of the individuals were engaged in a party. On crime days, partying only stops completely between nine and ten o'clock in the morning. The rest of the day contains parties for a proportion of the burglars.

For several of the burglars, the days after successful burglaries were the best for parties. Their descriptions of time usage seemed completely unstructured for two or three days while money and the drug supply was plentiful. They reported not to have slept during this time, and to have eaten very little. It was one long seventy two hour party followed by a brief "crash" and then a return to burglary. Although we can not document this activity directly, at least three unrelated burglars claimed this time scenario

Figure 20

WORK DAY: Aggregate Time Used Partying

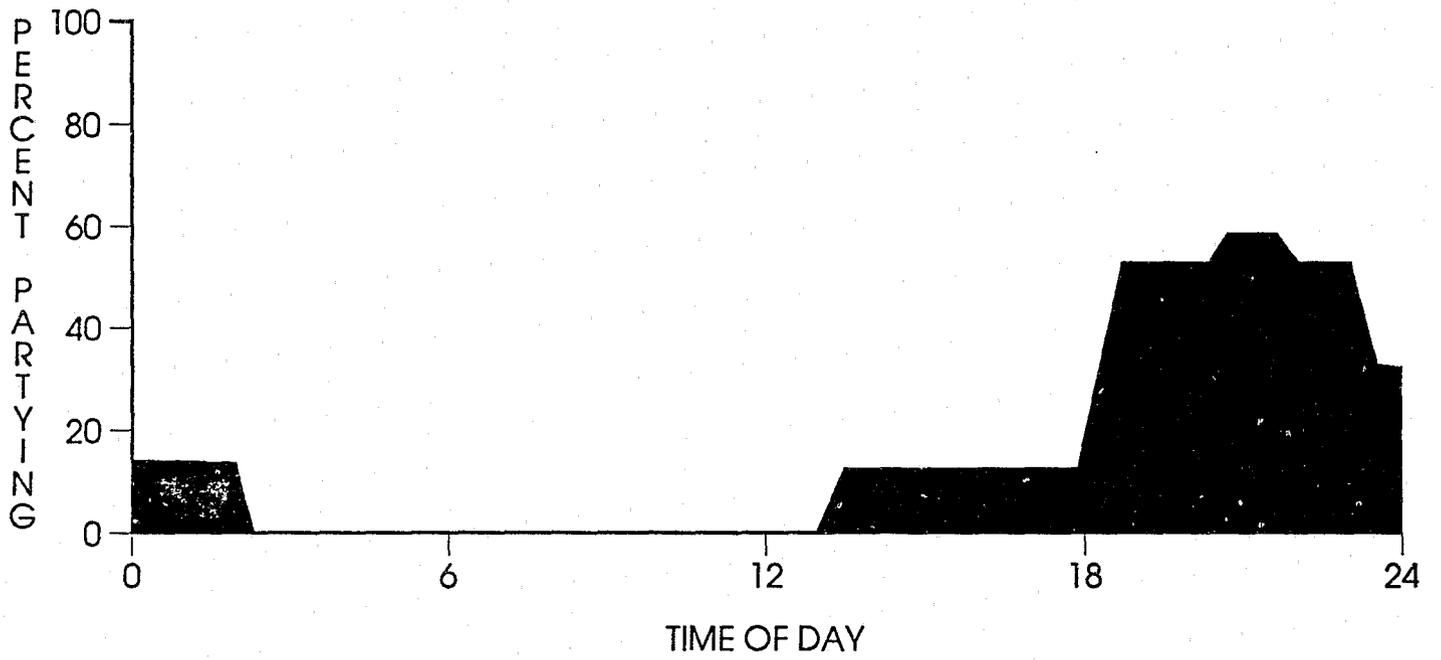
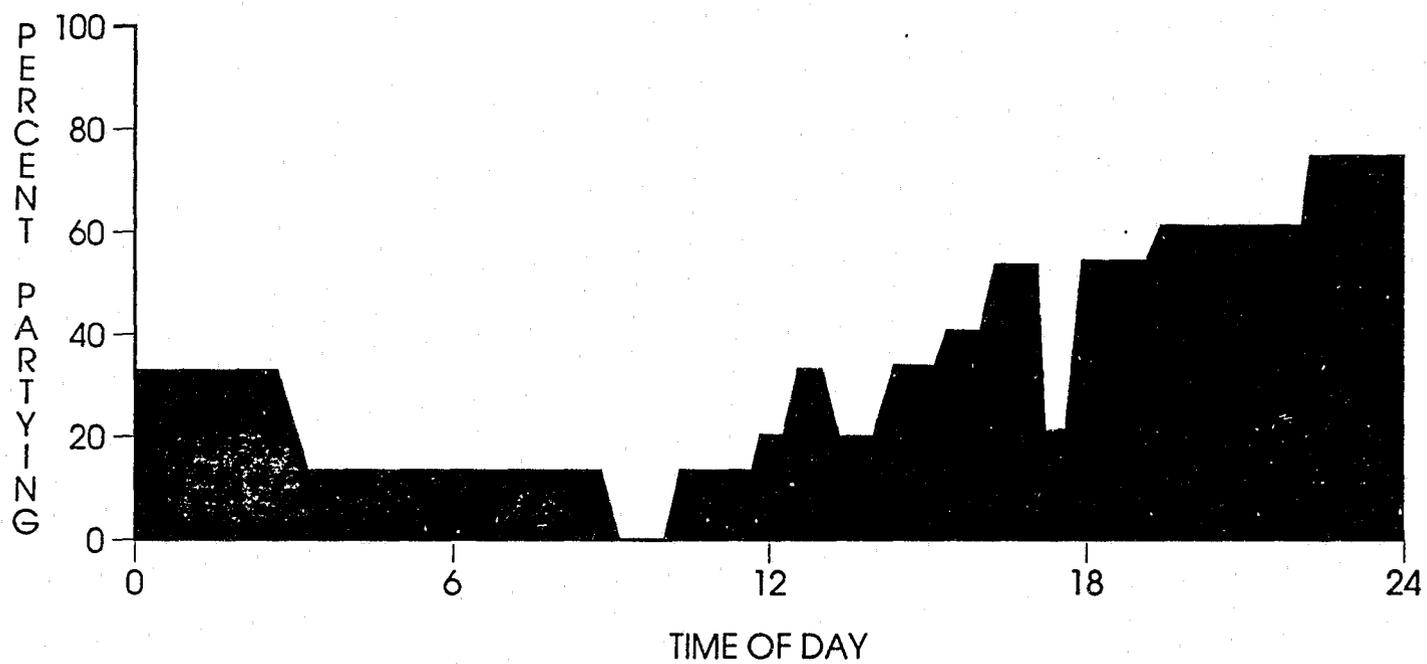


Figure 21

CRIME DAY: Aggregate Time Used Partying



independently. Partying seems to be a critical activity of active burglars with plenty of alcohol and drugs.

This temporal extent of partying is impossible while employed because of capability constraints of various types. For example, one could not function adequately or safely at work while using drugs or alcohol. Secondly, one can not be at a party and at work at the same time. And finally, the lack of sleep would impair adequate work performance. Burglary facilitates this degree of leisure activity.

Shopping was a term used by some burglars to describe an activity that was usually leisure, and might better be called "hanging out at the malls." Only suburban burglars engaged in this activity regularly enough to mention it in a diary. The difference between a crime day and a working day is striking for those who reported this behavior. On a crime day, these burglars often began the day at noon at a mall, and remained until six o'clock in the afternoon. Again, this is the preferred time when there are no constraints on your behavior. However, on a working day, capability constraints pushed shopping to between five and six o'clock in the late afternoon.

The next two activities are considered physiological necessities or non discretionary activities -- sleeping and eating. We have already noted that individuals who use

Figure 22

CRIME DAY: Aggregate Time Used Shopping

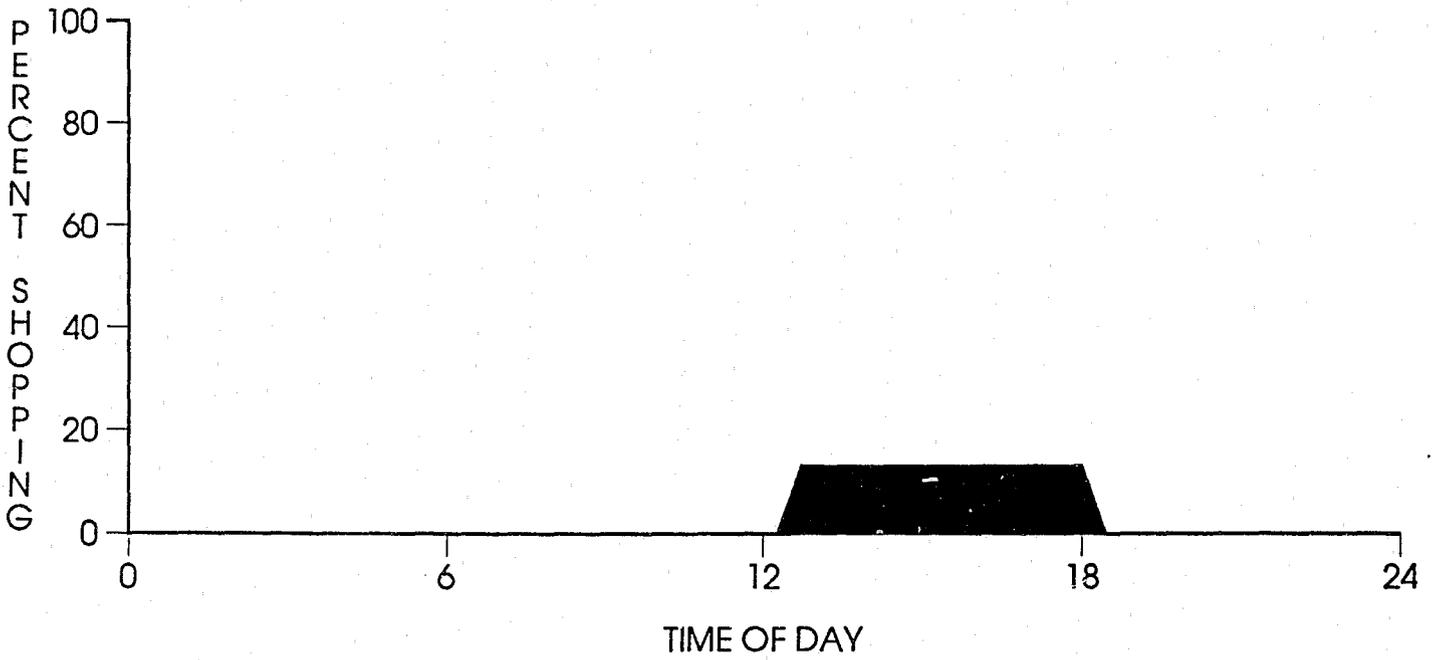
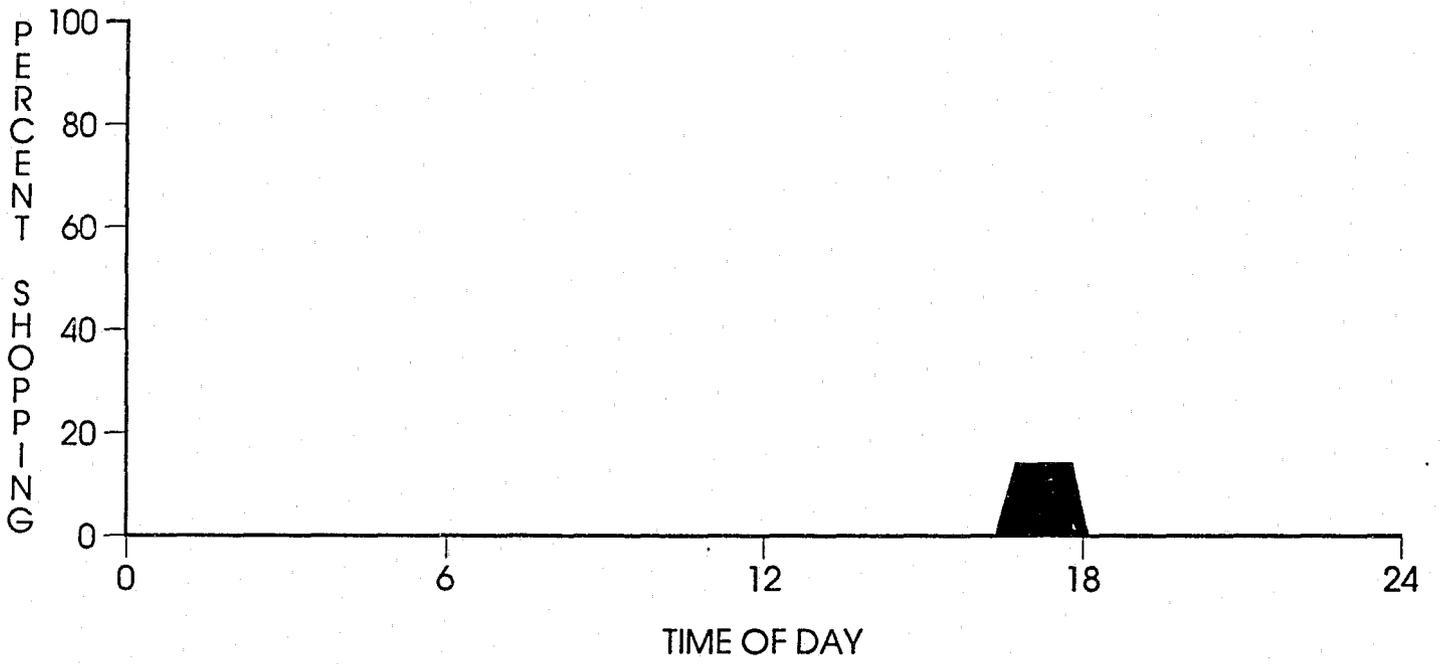


Figure 23

WORK DAY: Aggregate Time Used Shopping



certain types of drugs often postpone these activities for a considerable period of time. Sleep may be the most pressing of these activities. However, there are important differences. On work days, every individual in our study is up by ten o'clock in the morning. Most are up by six or seven o'clock. A few nap for an hour or two in the afternoon but most go back to bed by ten or eleven o'clock in the evening.

Crime days are very different. The majority do not get out of bed before noon. A few nap between one in the afternoon and nine in the evening. None went to bed for the night before eleven o'clock, and most did not go to bed before two o'clock in the morning. Nearly everyone was asleep at five o'clock in the morning, while every employed person was asleep by three o'clock in the morning. Obviously, sleep is postponed on crime days in favor of other activities -- usually parties and crime.

Eating is the least clear cut activity in terms of differences between crime and work days. As expected, on work days, eating is constrained to specific periods of time with large proportions of individuals participating. For example, between noon and one o'clock nearly every employed individual ate lunch, while just over forty percent ate something (for some it was breakfast) at this time on a crime day. Eating is spread over more of the day on crime

Figure 24

WORK DAY: Aggregate Time Used Sleeping

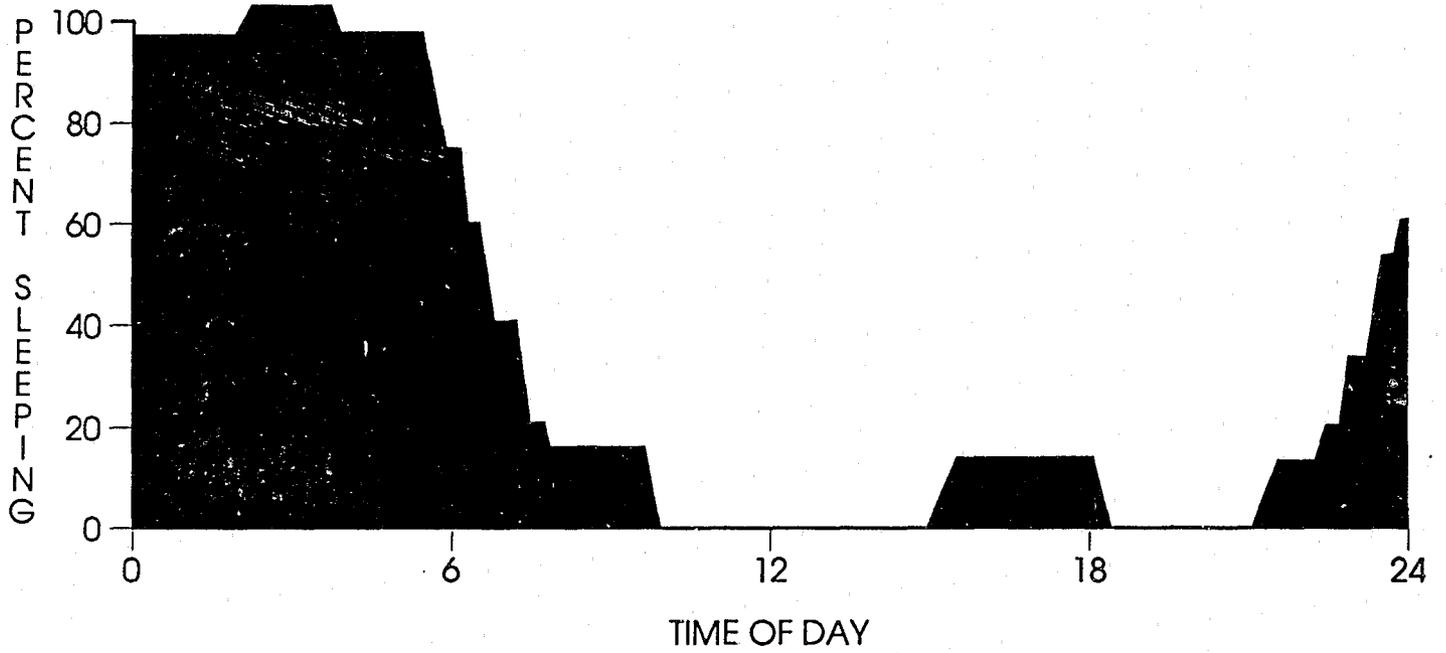


Figure 25

CRIME DAY: Aggregate Time Used For Sleeping

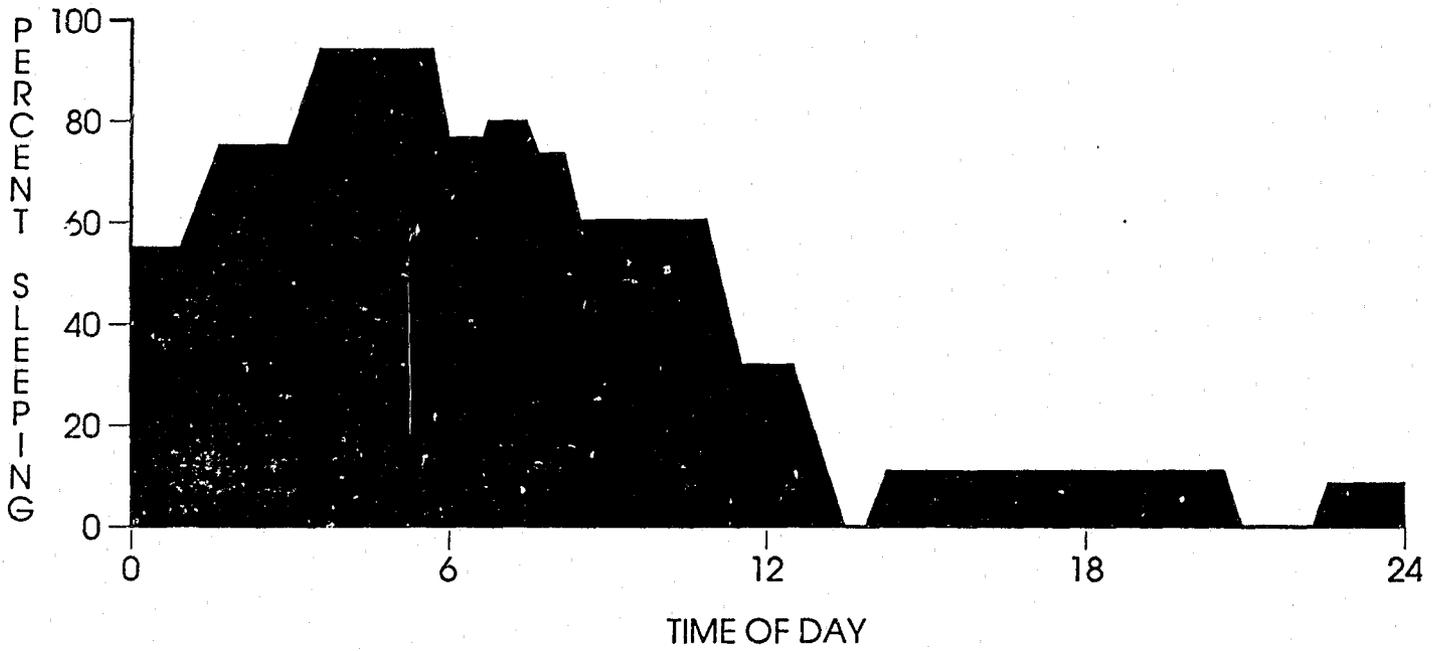


Figure 26

WORK DAY: Aggregate Time Used Eating

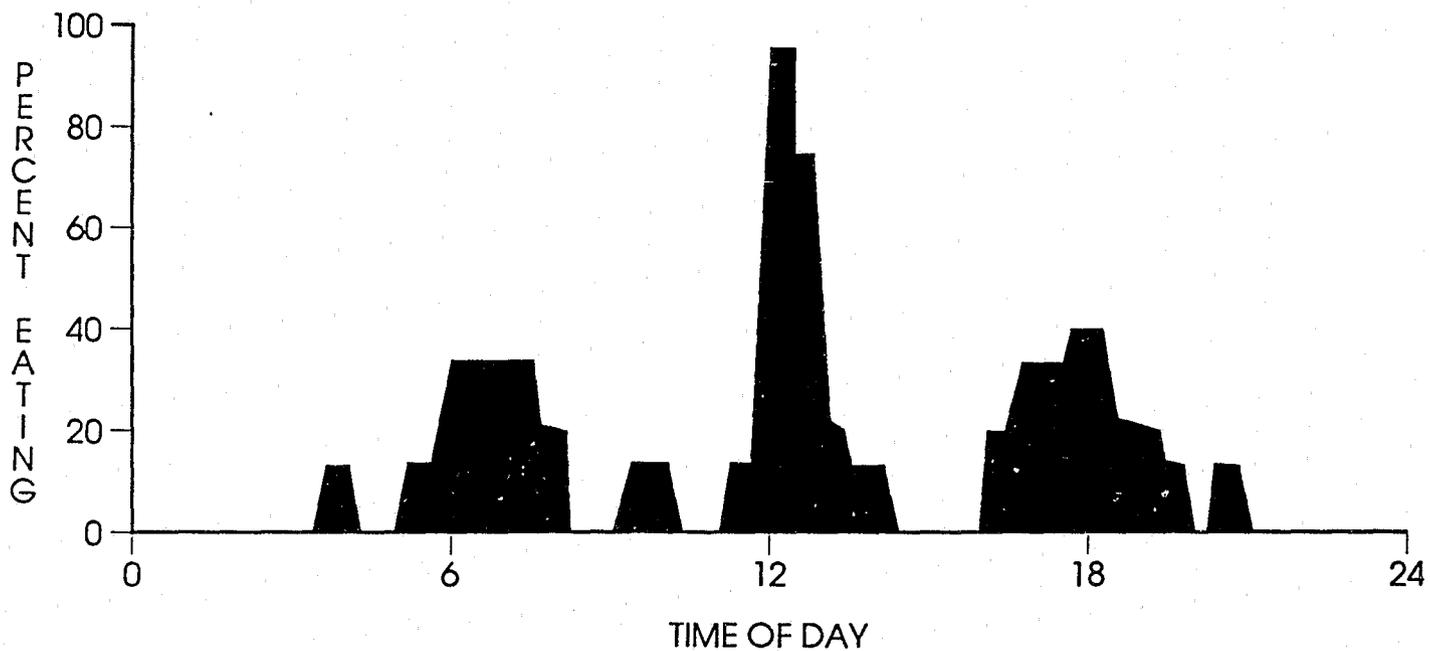
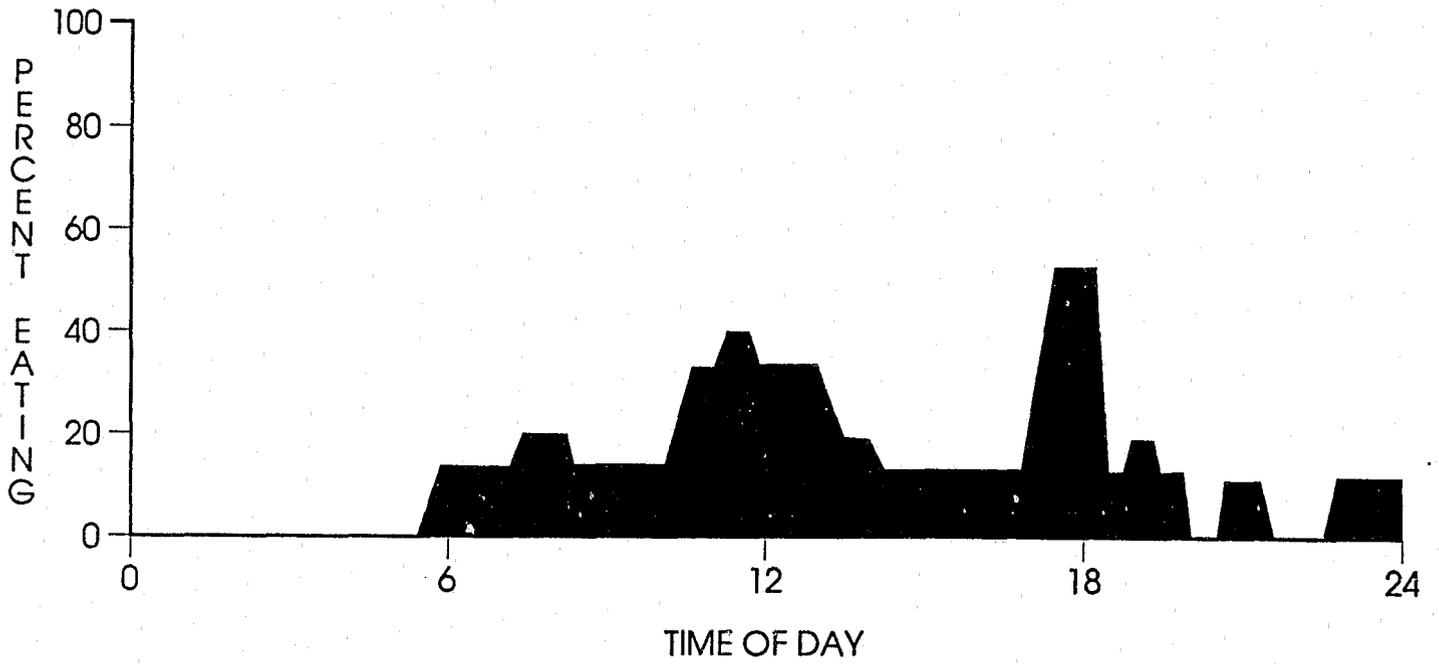


Figure 27

CRIME DAY: Aggregate Time Used Eating



days than on working days. For example, although none ate between ten o'clock and midnight on a working day, a few did on a crime day. Again, employment seems to constrain even nondiscretionary activities into specific time periods. Burglary allows much more flexibility in decisions about when and if to eat.

This brings us to the final two activities we considered -- work and crime. These two activities are considered together because they are very often traded off against each other. As demonstrated in our previous research, a very active criminal can neither be employed (because of capability constraints of conflicting time demands), nor financially needs to be employed (Rengert and Wasilchick, 1985). We again found that few of the individuals in this study maintained employment once they became very active as a burglar. However, from time to time they would obtain a job and cut back or eliminate burglary from their lives only to repeat the cycle by quitting the job and returning to full time crime.

When employed, nearly one hundred percent of the individuals in this study worked between nine and eleven-thirty in the morning. Most worked between one and four in the afternoon. This is a typical work pattern. What is a bit less typical is the temporal pattern of crime of the individuals we studied. Many burglars were active in crime

Figure 28

WORK DAY: Aggregate Time Used Working

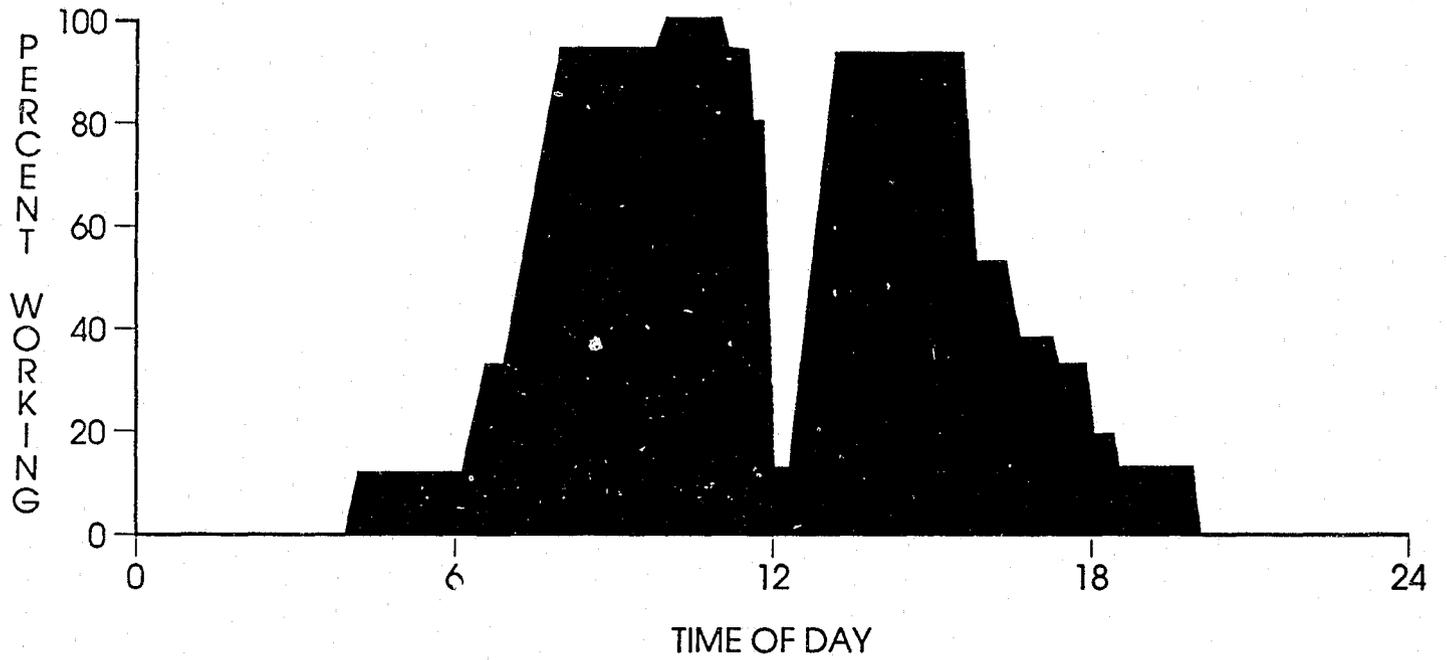
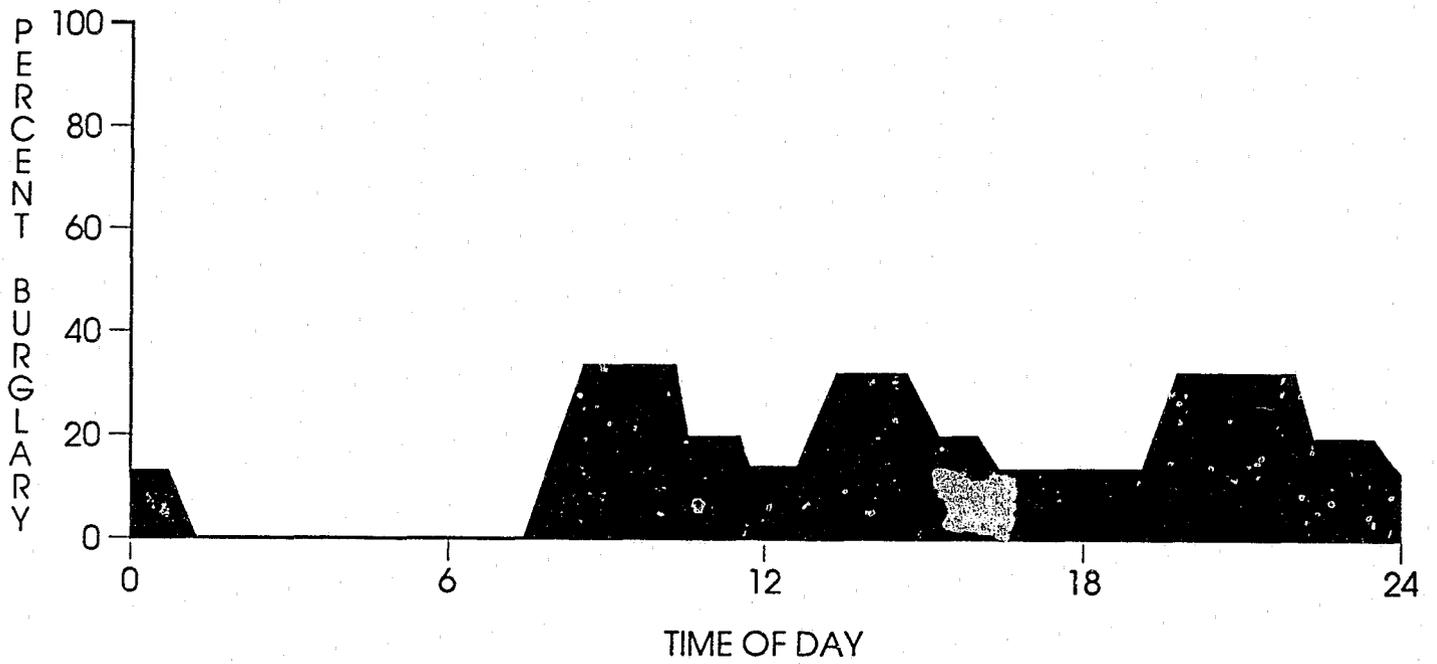


Figure 29

CRIME DAY: Aggregate Time Used For Burglary



between eight and ten o'clock in the evening. Other peaks are at between eight-thirty to eleven thirty in the morning, one to three o'clock in the afternoon.

Eight to ten o'clock in the evening is not the usual time for burglaries. Part of the explanation for this unusual time pattern is that our group of burglars is dominated by inner city burglars who burglarize in neighborhoods that have a high unemployment rate. Therefore, houses are not as likely to be empty between nine and eleven o'clock in the morning as in neighborhoods which contain two career households. Indeed, several of the inner city burglars we talked to burglarized occupied houses late at night while the occupants were asleep. They could not predict when people would be away from their homes at other times, but they could predict when they were most likely to be sound asleep and, there are no children all over the streets late at night. Others committed burglaries at night because they were employed during the day.

Another partial explanation lies in the patterns of several of the suburban burglars. Suburban burglars were more likely to be active in the early morning or early afternoon time periods when employed people are least likely to be home. This was a time of exploration as well as burglary. Houses that had potential, but too much neighborhood activity would be returned to at night. If the signs of vulnerability were still there, the burglar would

be confident that no one was home. A few burglars were especially sensitive to the possibility people were on vacation. These houses held special promise because they could be burglarized at night and with little risk.

Most burglars however, used the nine to eleven and one to three time blocks. The important thing to notice is that the two earliest peaks in burglary (eight thirty to eleven thirty and one to three) are not possible on working days because of capability constraints. Employment precludes the simultaneous use of this time for crime and legitimate employment. It is interesting to observe how the use of time for other activities shifts when individuals are not constrained by employment. Sleep moves into the hours before noon and leisure activities of watching tv and partying moves into the early afternoon hours.

Crime provides the individual with a relatively unconstrained life style. Except for the physiological needs of sleeping and eating, the individual is free to do most other activities, including breaking the law when authority constraints are not effective. Like Robinson Crusoe who discovered himself shipwrecked on an uninhabited island, criminals are relatively free to pursue life engaging in whatever activities they desire at what ever time they desire. Those engaged in drug abuse often abandon the physiological needs of sleeping and eating for several days

at a time. The use of time by drug users seems chaotic -- they do not follow a regular circadian rhythm we have grown used to. When they feel like doing something, they usually do it, no matter what time of day it is. As Burglar D told us, "When I'm high, the police are at my apartment all the time because of people complaining about the noise and stuff."

Although the use of time by the criminals in this study may seem chaotic to us it is not necessarily irrational from their perspective. Time depends on our perspective. As stated by John Horton (1967, p. 9),

"Time in industrial society is clock time. It seems to be an external, objective regulator of human activities. But for the sociologist, time is not an object existing independent of man, dividing his day into precise units. Time is diverse; it is always social and subjective. A man's sense of time derives from his place in the social structure and his lived experience.

The diversity of time perspectives can be understood intellectually -- but it is rarely tolerated socially. A dominant group reifies and objectifies its time; it views all other conceptions of time as subversive -- as indeed they are."

John Horton (1967, pp. 7-8) goes on to describe the structure of street life which very closely parallels that of the burglars in this study -- both urban and suburban, black and white.

"Keeping cool and out of trouble, hustling bread, and looking for something interesting and exciting to do created the structure of time on the street. The rhythm of time is expressed in the high and low points in the day and week of an unemployed dude.... The sometimes employed will also know the pattern, and he will be able to hit the street whenever released from the bondage of jail, work and the clock...

Characteristically the street person gets up late, hits the street in the late morning or early afternoon, and works his way to the set. This is the place for relaxed social activity...

On the set, yesterday merges into today, and tomorrow is an emptiness to be filled in through the pursuit of bread and excitement. The rhythm of time - of the day and of the week - is patterned by the flow of money and people.

Human behavior is rational if it helps the individual to get what he wants whether it is success in school or happiness in the street... (Street people) act rationally in those situations where they are able to plan and choose because they have control, knowledge, and concern, irrationally where there are barriers to their wants and desires."

The individuals in our study fit this scenario very well. Often they described how they went to Atlantic City in the middle of the night "because we felt like it." They would stay until their money ran out. Activities are often decided on the spur of the moment. Time only becomes crucial when their money begins to run out. Time for these burglars' was also patterned by the flow of money and people. When more money was needed, a burglary was planned. If the party began to die for lack of people, the individuals in our study would find more people, or another party.

This life style from the burglar's perspective is not chaotic or irrational. It makes perfect sense to the burglar. This lifestyle is however, decidedly nonconformist and is accompanied by a stiff social price. Burglars cannot maintain both their lifestyle and a non criminal life. It is hard to determine from our perspective whether an inability to conform to time constraints led these individuals to crime or if crime allowed them to adopt this life style.

Perhaps both are at work. It is clear that their lifestyle precludes participation in most of the activities the law abiding world expects from its members. It also pits the burglar's version of rational behavior (Cornish and Clarke, 1976) against the rational behavior practiced by his law abiding neighbors. The complaints of neighbors, Burglar D was cited as an example above, are an example of the social cost of this non conformity.

The question then becomes what can we do to control this criminal behavior. Certainly if it is not irrational behavior, we are not going to change it by reasoning with these individuals. Also, mild authority constraints such as the notions of private property, locks, and alarms have not deterred most of these individuals. They view these constraints only as barriers, and sometimes challenges, to be overcome.

Other constraints identified by Hagerstrand do not fair any better in structuring these criminals' lives because they have eliminated the major activity which provides structure to most peoples days -- work. Without eight hours out of the day for employment, there are very few constraints on other activities. There are no other activities which have to be done at a particular place at a particular time. Even sleeping and eating can be fit in when and where it is most comfortable, rather than when and where

it is necessary to make it to work the next day. Not having to be employed is a very liberating experience. If one can live well without being employed, it is not surprising that many choose not to work.

Law abiding citizens as well as criminal justice practitioners are left with the question of how to control this unlawful behavior. A useful exercise is to examine the commonly administered sanctions of the criminal justice system in terms of Hagerstrand's constraints on human behavior. This new way of conceptualizing sanctions may provide insight into their relative effectiveness. We will start with severe sanctions and work down to the less restrictive ones.

TABLE 6: Sanctions and Constraints

	authority	coupling	capability
incarceration	T/S		
work release	T/S	T	S
intensive supervision with work component	T/S	T	S
probation/parole	S		
fine			
restitution			
curfew	T/S		

T=constraint on the use of time
S=constraint on the use of space

From the above table, it is clear that the only sanctions which constrain the use of time are incarceration, curfew, and work related sanctions. It may be that employment is and can be an important deterrent to crime. However, the nature of the deterrence may be very different than generally assumed. Many assume that employment provides an alternative income source to crime which nearly everyone would choose if given the opportunity. Our research demonstrates that all the individuals we studied had several chances to choose work over crime. Their life paths demonstrate a succession of jobs, most of which were quit within a year for a variety of reasons. Most also quit high school for similar reasons. The reasons generally center around the greater freedom associated with not being in school or having a job. The excuses ranged from "the boss called me a jerk" to "I just didn't feel like working anymore." Most revolved around, "nobody tells me what to do" which exemplifies the value these individuals place on complete freedom of time and space use.

Table 7 illustrates the variety of jobs held by our burglars over time. It also illustrates the amount of time spent in employment and in unemployment. Like the individuals described by Horton (1967), our burglars often sampled employment, but seldom found it satisfactory.

TABLE 7: Life Paths of Burglars

YEAR	BURGLAR A	BURGLAR B	BURGLAR C
1990	GROCERY CLERK TAVERN/BAR x x ROOFER +	OFFICE RENOVATION + PRISON + +	+ PLASTERERx DRYWALLx +
1985	PRISON + + +	x TRACK/GROOM + x ^ ^ ^	+ + + x ^ ^ ^
1980	CONSTRUCTION x NURSERY x	^ ^ ^ ^ ^	^ ^ ^ ^ ^
LABORER	^ x	^ ^ ^ ^	^ ^ ^
1975	CONSTRUCTION x ^ ^ ^ ^ ^	^ ^ SCHOOL ^ ^	^ SCHOOL
1970	^ ^ ^ ^ ^		
	SCHOOL		
1965			
1960			

+ = Unemployed
x = Quit school or job

TABLE 7: Life Paths of Burglars (continued)

YEAR	BURGLAR D	BURGLAR E	BURGLAR G
1990	CONSTRUCTION	DISHWASHER	+
	^	+	+
	^	+	PRISON
	CONSTRUCTION	+	+
	+	+	PRISON
1985	+	GRADUATED	LABORER
	+	^	+
	+	^	PRISON
	+	^	+
	+	^	FACTORY
	GRADUATED	^	PLASTERER
1980	^	^	PRISON
	^	^	MOVER
	^	^	CARPENTER
	^	^	X
	^	^	^
1975	^	^	^
	^	^	^
	^	^	^
	^	^	^
	^	SCHOOL	^
	^		^
	^		^
1970	SCHOOL		^
			^
			^
			SCHOOL
1965			
1960			

+ = unemployed
 x = quit job or school

TABLE 7: Life Paths of Burglars (continued)

YEAR	BURGLAR K	BURGLAR L	BURGLAR M
1990	SALES/DRIVER PRISON	CONSTRUCTION x	TEMPORARY+ AUTO DETAIL
	SALES CLERK MECHANICx	TV REPAIR PRISON	JAIL
	SALES CLERKx	x	TEMPORARY+
1985	MECHANICx	TV REPAIR	MOVER
	PET STOREx	PRISON	AUTO DETAIL
	x	x	x
	produce stand	^	^
	^	^	^
	^	^	^
1980	^	^	^
	^	^	^
	^	^	^
	^	^	^
	^	^	^
	^	^	^
1975	SCHOOL	SCHOOL	SCHOOL
1970			
1965			
1960			
1955			

+ = unemployment
x = quit job or school

TABLE 7: Life Paths of Burglars (continued)

YEAR	BURGLAR V	BURGLAR Y	BURGLAR Z
1990	PRISON + PARALEGALx STUDENTx ^	PRESSER + + + +	ROOFER PRISON ^ ^ ^
1985	PRISON + + x HOTDOG CART ^	PRISON + PRISON + x PARKING LOT x	PRISON + + + ODD JOBS x ^ ^
1980	PRISON + + + +	FACTORY ^ ^ PRISON x	^ ^ ^ ^ ^
1975	x ^ AIR FREIGHT ^ ^	TRASH MAN x SHOE SALES x WAREHOUSE +	^ ^ ^ ^ ^ ^
1970	ARMY GRADUATED ^ ^ ^ ^	GRADUATED ^ ^ ^ ^ ^ ^	SCHOOL ^ ^ ^ ^ ^ ^
1965	^ ^ ^ ^ ^ ^ ^	^ ^ ^ ^ ^ ^ ^	^ ^ ^ ^ ^ ^ ^
1960	^ ^ ^ ^ ^ ^ SCHOOL	^ ^ ^ ^ ^ ^ ^ ^ ^	^ ^ ^ ^ ^ ^ ^ ^ ^
1955		SCHOOL	

+ = unemployed
x = quit school or job

The Life Paths of Burglars

"Nothing can touch an individual's life without influencing the course of her daily path, and nothing can influence the course of her daily path without having the potential to touch upon her life path" (Pred, 1981, p. 24). When an individual's life path takes on a role that is oriented toward a specific goal, he must, as a consequence, repeatedly channel his daily-path into specific activity bundles defined by the chosen role. As we will observe, the goal of obtaining a daily livelihood may be satisfied by either lawful employment or unlawful criminal activity. The choice is up to the individual in most cases. Furthermore, we have discovered more choice here than is generally portrayed in the literature (Currie 1985).

As a result of participating in a specific activity bundle, the individual is more or less constrained from participating in other activities at the same time and at different locations. Furthermore, the individual is exposed to different people, objects, ideas and information impulses depending on the choice made (Pred, 1981). In turn, these exposures help shape the choices subsequently made about which other roles to choose. These ideas are at the heart of differential association concepts in criminal justice as well as time-space geography. Let's examine how they have shaped the life paths of selected individuals in this study.

Tracing the life-paths of selected burglars identifies alternatives that were available to these individuals over time in their spatial domains. Burglars are not all alike. Some are born in poverty and live in very restricted spatial domains. Others have middle and upper-middle class parents and live in a less restricted spatial domain. Some live their lives in the inner city relying on their feet and public transportation to traverse space. Some live in the suburbs and have access to automobiles at an early age. We will discuss examples of each to illustrate the divergent paths to crime which exist in our society. We begin with the case of an inner city individual raised in poverty who has not escaped his situation. This is the example most often considered the typical case by the general public as well as criminal justice scholars (Currie, 1985).

Inner City Poverty Life-Path to Crime: Burglar G

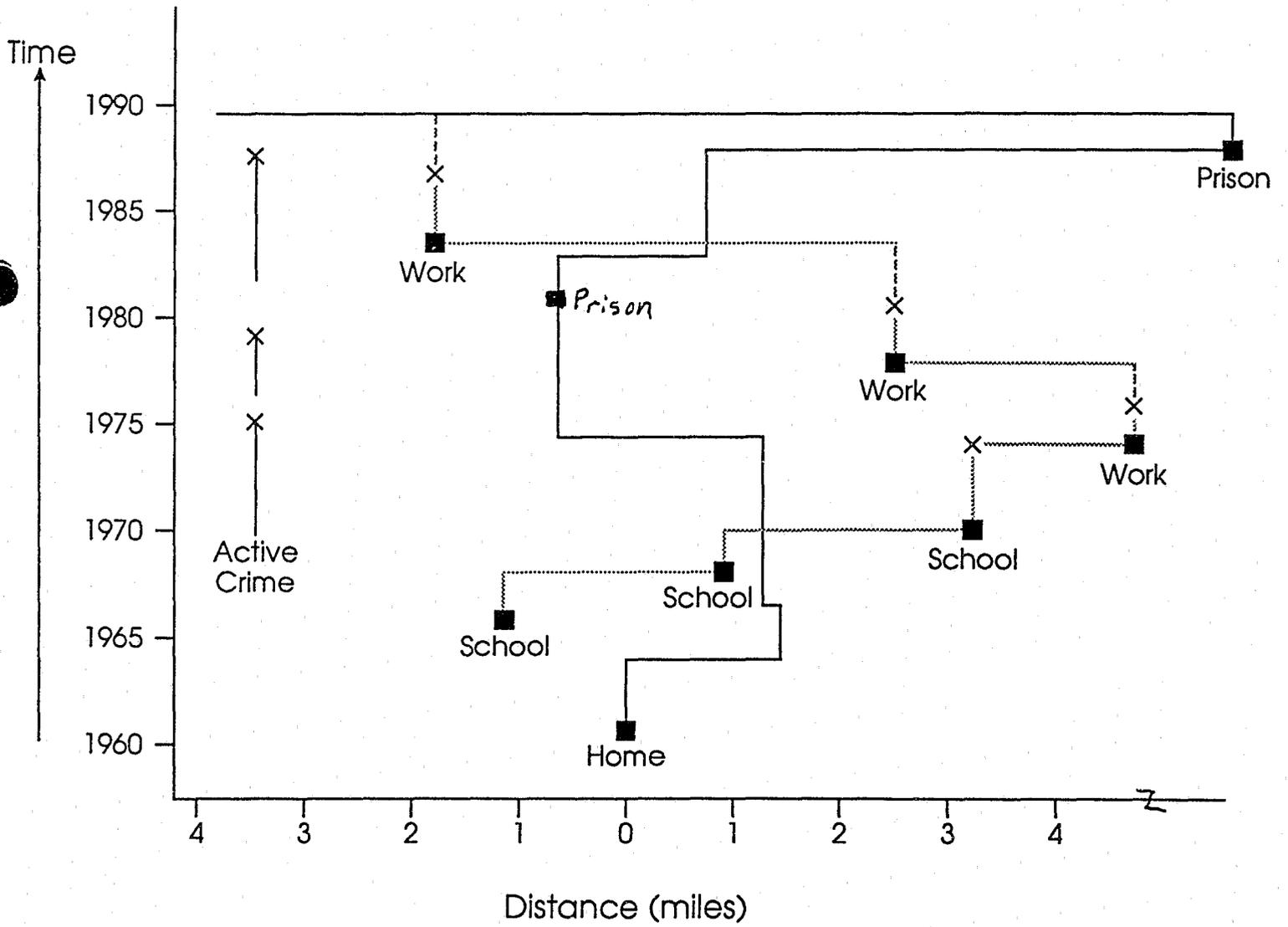
Burglar G is an excellent example of an inner city youth who chose burglary as a career. He is from a ghetto neighborhood in North Philadelphia where poverty, crime, drugs and gang activity are part of daily life. He is now 27 years old. Burglary has been a source of livelihood, often the only source, since he was 16 years old. He has committed more burglaries than he can count. He has seldom been caught although he has been to prison.

Burglar G is the youngest of nine children. He was a "love child" born to his parents long after they assumed their family was complete. Burglar G is 20 years younger than the next youngest sibling, and two of his brothers are over 50 years old. His parents came to Philadelphia from Alabama. His father, now in his early 80's, is a "hard man." He survived five years of hard labor on a chain gang in Alabama, and has survived in the North Philadelphia neighborhood where he continues to live. Two of Burglar G's older brothers are currently in prison, one serving a life sentence for murder. While his origins are in an area of extreme poverty, Burglar G is an articulate, perceptive person.

We begin our description of his life-path at the point where he entered school. He completed eleven years in inner city schools. He was frequently in trouble with the police during his junior high school years and began committing burglaries during his high school years. He told us that as a juvenile he "had no fear" because there were very few sanctions even when he was caught. If arrested, his parents would be called to the police station to pick him up. He was never convicted of a crime in juvenile court. The police expected his parents to handle his problems as a family matter.

FIGURE 30

Life path of Burglar "g": Home and Work Places and Crime Periods



x = Quit or fired

⋮ = Unemployed

Although very familiar with criminal activity, Burglar G has never been reluctant to work in legitimate jobs. He left high school before graduating and worked as a carpenter. He worked as a carpenter for over one year. During his carpentry career he continued to burglarize homes in the evenings. He next worked as a mover. He worked as a mover for only several months before going to prison in 1981, where he served 11 months of a 23 month sentence. While in prison he learned plastering and brick work from a mason. Returning home, he worked for a time as a plasterer in 1982 before going to work at a local factory that produced chemicals. "I went from stacking boxes to bein' a chemist in that job," over the course of three years. During his career at the chemical plant he was apprehended for a burglary in an affluent suburban area in 1985. After spending four months in a suburban county jail because he could not make bail, the case was thrown out. He worked as a temporary laborer through an established labor supply agency until returning to jail for another six months in 1987. He has not worked since returning in 1988 and is currently looking for work.

His scared face and chipped front teeth testify to those occasions when his victims handled law enforcement matters locally with out the need for police. He recounted several episodes where the victims caught him in the act and rather than wait for the police, administered severe

beatings. "They hit me with them short sticks that they use for fireplaces. I got loose and grab one. When I hit back with my stick, it done shattered right in my hand, into like splinters. Stuff like that always happening to me." He went on to describe how the police saved him from what was rapidly becoming an angry mob of irate residents on another occasion, and took him to the hospital where he spent several days before arraignment. Burglar G told these stories humorously.

Several members of his family have sever drug problems. One of his older brothers died of a drug overdose. This has had an important impact on his life. He has never had a desire for drugs. He uses alcohol and spends a lot of time in bars associating with friends, but steers clear of hard drugs of any other type.

Inner City Middle Income Path to Crime: Burglar M

Burglar M is an example of an inner city burglar living in a middle class community. He lives with his mother in a modest row home in the Germantown section of Philadelphia. The surrounding neighborhood includes several more blocks of row homes bordered by twins and large detached homes. Burglar M, his mother and older brother moved to Germantown when he was a toddler from a deteriorating neighborhood in North Philadelphia.

His mother owns their home, and there is no mortgage. Home ownership in a middle class area is a considerable accomplishment for a single parent. His mother has worked very hard toward this end. His mother expends considerable energy and monetary resources to resolve Burglar M's criminal problems. She mortgaged the house at one point to bail him out of jail. She often accompanies him to his probation meetings; dropping him off with the probation officer and returning to pick him up after the meeting. It is clear that this burglar did not wander into crime because of a lack of supervision or to meet basic material needs. He has had, and continues to have, active parental involvement and encouragement to become a successful member of society. "Livin' at home with my mom, that's the toughest supervision of all."

Burglar M went to school through the eleventh grade. He left school "because of all the trouble I was gettin' into." He was "hangin' out" with friends who dabbled in drugs as well as burglary. He continues to spend his leisure time with these friends.

After leaving school he worked as an auto detailer. He had learned auto detailing from his mother's boyfriend. Burglar M worked as a detailer at two auto dealerships, both jobs together lasting less than one year. He was fired from

the second job when he refused to stay late and work overtime. He worked as a cook at a fast food restaurant in downtown Philadelphia, but only for three weeks. During all this time he was committing burglaries, usually in the evenings or on weekends.

Intermittently, he worked for a friend's father as a mover. They are local people from Burglar M's neighborhood. Burglar M also got some occasional work through a temporary agency. They sent him to various parts of the city and suburbs for a couple days to a couple weeks at a time. He can not remember all the places and jobs. This lasted almost one year.

During this time he was caught by the police for speeding in a car that he had stolen from a house he had burglarized. It was his first serious offense and he was released within hours.

He then went to Columbia, South Carolina to live with his aunt. He was there for over three months. While there he worked fairly steadily through a temporary agency. He worked mostly as a laborer doing construction and some manufacturing. He liked Columbia. His aunt worked at the local bank and was trying to get him a job there. Just as she learned that a job would be opening that was suitable

for him and that he would probably be hired, his mother called and told him his "court papers" had arrived.

During his stay in Columbia, Burglar M reported that he did not commit any crimes and was completely drug free. His only vice was a beer after work.

The "court papers" were actually notice that a bench warrant had been served. He appeared and was told by the court officer to come back the next day. They gave him a time and a court room number. Burglar M said he just figured "this must be the way it works."

He returned the next day as assigned. Instead of the hearing he expected, he was put in handcuffs and hauled away to jail as a fugitive. He spent over one month in jail. His mother tried to arrange bail, but was told that she could not put up the house as bail. When she later found out how her property could be used to arrange bail, Burglar M was released.

After being released from jail, he again worked at an automobile agency as a detail person for about three months when he was fired in a dispute about his hours. For a little over a year, he has again worked at temporary jobs through an agency. The longest was about six weeks at an air freight

company and again at a manufacturing plant. He has had other jobs that have lasted a few days or more.

He is currently trying to get work through a local labor union where several relatives are members. After six weeks, he has not yet been hired to work on a job.

When asked if he had a problem with drugs or drinking or anything that caused him to do burglary, he said he "smoked a lot of reefer and drank a lot of beer, but I don't have no problem." He then said, "It's hard to say why I do the things I do."

Burglar M is an engaging 21 year old man. He is young and athletic in appearance. He looks more like a rapper or basketball player than a criminal. As he continues to dabble in drugs and crime, his use of time will be a key indicator of whether he is moving closer to or farther from a lifestyle based on the easy money crime can supply. He values his party time with his friends, as suggested by his losing jobs by refusing to work late. Capability constraints related to this leisure time keep him working at temporary employment at best. He does not want to be tied to long working hours.

Suburban Middle Income Path to Crime: Burglar A

Burglar A is an example of a burglar who was raised in the suburbs by middle class parents. He was born in Philadelphia and adopted in infancy. He was raised with an older sister who is a college graduate. He does not get along with his sister who cannot tolerate his criminal behavior and the anguish it causes their mother. His father died of stomach cancer about ten years ago, not long after retiring from a long career with a large, Delaware chemical company. His mother continues to live comfortably in the suburban home Burglar A grew up in.

Burglar A's criminal life began in his early teens. He began stealing money from his parents to buy beer, and for spending money. The first house he burglarized was a neighbor's house. He was passing by and found the window open. He went in, and found cash and other valuables. He told a friend about the burglary and together, they began burglarizing other houses. By the time he was eighteen years of age, he was involved in over 200 burglaries. He has been charged with over 70 more as an adult, and has committed far more. For most of his burglary career, he has committed burglaries with the same friend from his early teenage years. He has spent nearly four years of his life in prison.

Burglar A never completed high school. When he quit school, he took a job in construction, then sold clothing, worked in landscaping, a nursery, concrete work, roofer, and stocking shelves in a grocery. Two separate prison terms and several periods when he did not hold a legitimate job can also be included. Needless to say, few of his jobs lasted more than a few months. Burglar A admits to being addicted to "high living". He found that through the proceeds of burglary, he could afford to match or exceed the lifestyle of his parents. He has rented large vacation homes on the ocean in Longport for a month at a time. He gambles in Atlantic City, and has been "compted" to special privileges by the casino management as a valuable customer. Needless to say, none of his jobs could ever provide this lifestyle. Burglary can, and does.

The life path that Burglar A has chosen is one of a life of crime even though he was raised in an orderly, middle class suburban community. He aspires to the rewards of middle class life, while failing at the middle class work ethic that usually produces them. In fact, he discovered crime quite on his own. He was not led into crime by other associates as in previous cases, or raised in an environment where crime was an easy example to follow.

These three burglars illustrate diverse life-paths to crime. Burglar A chose crime through his own initiative,

Burglar M was taught crime through his peer group, while Burglar G was raised in a community saturated with crime. As the life-paths for each burglar show, each had many opportunities to lead a legitimate lifestyle. They held a variety of jobs which they generally quit within a matter of months. For a variety of reasons, they do not like to work. Burglar G does not like to be told what to do by a job foreman. He does not deal well with authority constraints on his activities. Burglar A enjoys the money and lifestyle he can afford with burglary but not with menial employment. Burglar M enjoys being with his "crowd" late at night and having the material things that go with being one of the guys. Coupling and capability constraints mean that he can not work long hours, sleep enough to be alert at work and still be available when his friends "party."

Conclusions

We feel that one lesson to be learned from our study is that simply supplying a convict with a job without monitoring his performance is not likely to be successful. We are convinced that intensive supervision is necessary for after conviction or release; at least until it becomes clear that the convict has a stake in maintaining employment beyond the weekly paycheck. This stake may be when he earns a position of greater responsibility such as supervisor or foreman. Or, the stake may be a change in family responsibilities such as marriage and children.

Employment is not just a means of earning an income, but also a social indicator of the convicts' performance as a law abiding citizen. As long as the employee is simply putting in the time to obtain a paycheck, he is not likely to remain employed when not supervised. Intensive supervision, when appropriately assigned, is the best means of monitoring this adjustment in the convict's life.

It bears repeating that employment is an important ingredient in the reformation of a property criminal. However, the reason it is important is not the paycheck it provides (a burglar can provide himself with a much larger paycheck with less effort), but because it constrains alternative activities that are not possible for the

individual while he is employed. Keeping a convict employed is not a simple matter. It takes much more than supplying him with a menial job with minimum wages.

A probation supervisor in another state once told one of the authors that "you can't require a convict to be employed; it is not against the law to be unemployed." This statement illustrates how we often miss the point. Employment is an important component of rehabilitation. As such, it can be made a part of a probation or parole plan, just as attending a drug rehabilitation program can be made part of a probation or parole plan of a drug user. Habits of time use often need to be changed just as habits of drug use need to be changed in some individuals. However, training convicts for menial jobs may not be satisfactory. As noted above, two burglars we studied committed crimes while employed at menial jobs.

Questions of training and qualifications are also often raised. While incarcerated, early release programs may be tied to literacy programs. In today's society, there are few satisfactory jobs available to the functionally illiterate. Inmates should show signs of attempting to improve their qualifications for employment to be eligible for early release programs. An employment plan requires more than simply "brainstorming" or "jiving" from the inmate. Objective steps and standards should be available and

utilized by inmates. Employment is not a gift from society -
- it requires effort to obtain and to maintain.

Conclusions

"There is nothing that can affect the time geography, or path, of an individual without affecting the time-geographic workings of society as a whole, nor is there anything that can affect the time geographic workings of society without affecting the path of an individual" (Pred, 1981, p. 246) Individuals and society are inexorably intertwined. Crime is directly involved in this dialectic. Any time an individual commits a segment of their daily path and finite time resources to an activity bundle, criminal or lawful, they subtract from the total daily time resources of society as a whole in their community or domain. They thereby reduce the number of other activity bundles that can be packed into the time-space organization of that domain. Conversely, every time the workings of society increase or decrease the demands made on the time resources of an individual, it results in a reduction (or expansion) of the number of other activity bundles that can be packed into the individual's daily or life path (Pred, 1981).

When individuals become involved in criminal activity, they place constraints on other, perhaps legal, activities that are possible. The impact goes beyond the individual. The victims of crime also have demands placed on their time as a result of the criminal activity. The victim of a burglary may have to take a day from work to secure or

resecure their home. Broken windows or smashed doors need to be replaced immediately. Victims also may reschedule activities due to fear and revolution associated with a burglary. Finally, if the burglar is apprehended, victims may need to reschedule activities to free blocks of time for lengthy court appearances. These demands on the time of victims have a multiplier effect on their activity domains. Coworkers may have to step in to complete work assigned to the absent worker; leaving their work to others (or piling up). Carpenters may be assigned emergency work to secure a home, subtracting or postponing time allocated to other jobs. Stolen property requires shopping time to replace. The total impact on society of this individual act has seldom been computed. Certainly the burglars we talked to are not aware of the total impact of their crimes.

Time-space geography also suggests solutions to criminal activity. We realize we run the risk of being accused of advocating social engineering if we concentrate unduly on constraints to criminals. However, constraints do not necessarily have to be oppressive. They can be individually desirable alternatives to criminal activity. We suggest that increasing options or choices available to criminals and encouraging those that place the fewest burdens on the time and space of others are such alternatives. Certainly, common authority constraints which are not incapacitative are not likely to be effective in the

long run. Our objective needs to be satisfactory both to the criminal and to society.

In the short run, these constraints will seem oppressive to a criminal. Our goal is to change habits of space and time use so that after a period of adjustment, the criminal may accept a new style of life. Certainly the gains to society, if we are successful will be substantial, and we owe no less to those who obey the law.

Bibliography

- Barrett, F.A. (1973) "Residential Search Behavior: A Study of Intra-Urban Relocation in Toronto," York University. Atkinson College Geographical Monograph No. 1 (Toronto).
- Brantingham, P. and Brantingham, P. (1984) Patterns in Crime. New York: MacMillan Publishing.
- Brown, L. A. and Moore, E. G. (1970) "The Intra-Urban Migration Process: A Perspective," General Systems Yearbook 15, 109-122.
- Brown, L. and Moore, E. (1970) "Urban Acquaintance Fields: An Evaluation of a Spatial Model," Environment and Planning A 2, 443-54.
- Chow, Y. S., Robbins, H. and Siegmund, D. (1971) Great Expectations: The Theory of Optimal Stopping. Boston: Houghton Mifflin.
- Clark, W. A. and Smith, T. R. (1979) "Modelling Information Use in A Spatial Context," Annals of the Association of American Geographers 69, 575-88.
- Cohen, L. and Felson, M. (1979) "Social Change and Crime Rate Trends: A routine Activity Approach," American Sociological Review, Vol. 44, pp. 588-608.
- Cornish, D. and Clarke, R. (1986) The Reasoning Criminal: Rational Choice Perspectives on Offending. New York: Springer-Verlag.
- Cullen, F. T. and Gilbert, K. E. (1982) Reaffirming Rehabilitation. Cincinnati: Anderson.
- Currie, E. (1985) Confronting Crime. New York: Pantheon.
- DeGroot, M. H. (1970) Optimal Statistical Decisions. New York.
- Figlio, R., Hakim, S., and Rengert, G. (1986) Metropolitan Crime Patterns. Moressey, New York: Criminal Justice Press.
- Goodman, J. (1978) Urban Residential Mobility: Places, People and Policy. Washington, D. C.: The Urban Institute. Page 17.
- Hagerstrand, T. (1970) "What About People in Regional Science?" Papers of the Regional Science Association 24, 7-21.

- Hempel, D. J. (1970) "Search Behavior and Information Utilization in the Home Buying Process," Proceedings of the American Marketing Association, Vol. 30, 241-249.
- Herbert, D. (1973) "The Residential Mobility Process: Some Empirical Observations," Area, Volume 5, 44-48.
- Horton, J. (1967) "Time and Cool People," Trans-Action 4, 4-5.
- Huff, J.O. (1982) "Spatial Aspects of Residential Search," in Clark, W. A. V. (ed.) Modelling Housing Market Search. New York: St. Martin's Press. 106-129.
- Jerdan, J. (1987) "Retail Level Heroin Enforcement and Property Crime," Final Report, National Institute of Justice. Washington, D. C.
- Lindley, D. V. (1961) "Dynamic Programming and Decision Theory," Applied Statistics 10, 39-51.
- MacQueen, J. and Miller, R. G., Jr. (1960) "Optimal Persistence Policies," Ops. Res. 8, 362-80.
- Michelson, W. (1977) Environmental Choice, Human Behaviour and Residential Satisfaction. New York, London: Oxford University Press.
- Moore, T. (1989) "Dead Zones: Whole Sections of Urban America are Being Written Off...." U S News and World Report, April 10. 20-32.
- Newman, O. (1973) Defensible Space. New York: Collier Books. page 206.
- Powis, D. (1977) The Signs of Crime. New York: The John Jay Press.
- Pred, A. (1981) "Social Reproduction and the Time Geography of Everyday Life," Geographifiska Annaler B 63.
- Rapoport, A. and Tversky, A. (1970) "Choice Behavior in an Optional Stopping Task," Organ. Behav. Hum. Perform. 5, 105-20.
- Reiss, A. and Tonry, M. (eds.) (1986) Communities and Crime. Chicago: University of Chicago Press.

- Rengert, G. and Mueller, P., (1972) "The Diffusion of Dangerous Drugs in New York State," paper presented to the Middle States Division of the Association of American Geographers, Genesco, New York.
- Rengert, G. and Wasilchick, J. (1985) Suburban Burglary: A Time and a Place for Everything. Springfield, IL: Charles Thomas.
- Rossi, P. H. (1955) Why Families Move: A Study in the Social Psychology of Urban Residential Mobility. Glencoe: The Free Press.
- Schneider, C. H. P. (1972) "Transportation and Individual Spatial Search in the Urban Environment," unpublished Ph.D. thesis. Northwestern University.
- Schuerman, L. and Kobrin, S. (1986) "Community Careers in Crime," in Reiss, A. and Tonry, M. (eds.) Communities and Crime. Chicago: University of Chicago Press, 67-100.
- Sherman, L. (1989) "Hot Spots of Predatory Crime: Routine Activities and the Criminology of Place," Criminology, Vol. 27, No. 1, 27-55.
- Silk, J. (1971) "Search Behavior: General Characterization and Review of the Literature in the Behavioral Sciences," Geographical Papers No. 7, Department of Geography, University of Reading.
- Sills, J. (1989) "Dealers Buy and Rent Corners," Philadelphia Daily News, April 19, p. 3.
- Smith, T. (1980) "An Analysis of the Effects of Information Revision on the Outcome of Housing Market Search with Specific Reference to the Influences of Realty Agents. Environment and Planning. p. 15.
- Speare, A., Goldstein, S. and Frey, W. (1975) Residential Mobility, Migration and Metropolitan Change. Cambridge, MA: Ballinger.
- Stellwagen, L. D. (1985) "Use of Forfeiture Sactions in Drug Cases," Research in Brief. Washington, D. C.: National Institute of Justice.
- Talarchek, T. (1982) "Sequential Aspects of Residential Search and Selection," Urban Geography 3, 34-57.
- Taub, R., Taylor, D., and Dunham, J. (1984) Paths of Neighborhood Change. Chicago: University of Chicago Press.

Turner, S. (1969) "Delinquency and Distance," in Sellin, T. and Wolfgang, M. E. (eds.) Delinquency: Selected Studies. New York: John Wiley, 11-25.

Von Hirsch, A. (1976) Doing Justice. New York: Hill and Wang.

Wilson, J. and Kelling, (1982) "Broken Windows: The Police and Neighborhood Safety," Atlantic Monthly, Vol. 255, 29-38.