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Space, Time, and Crime:
Ethnographic Insights into Residential Burglary

Time

1990

1985

Work

1980

Work

1975

Work

1970

Active
Crime

School

School

1965

School

School

1960

Home

Prison

4   3   2   1   0   1   2   3   4

Distance (miles)

X = Quit or fired   = Unemployed

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FINAL REPORT

SPACE, TIME AND CRIME:
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Acknowledgements

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Introduction

Burglary is not an isolated event or a random act. It does not happen by accident. It is the result of a series of decisions that lead to a specific location at a time when it is vulnerable. The goal of this research is to learn more about the decision making process of burglars, and to gain an understanding of their perceptions of time and space.

How does a burglar choose a house to burglarize? What are the considerations? To begin to answer these questions we needed to fit together a picture of the burglars' perceptions of space and time. We attempted to do this using ethnographic methods because our questions required more than aggregate data from police and victimization reports. The burglar's view of his activities, both criminal and non criminal, are needed for us to begin to understand burglary as a result of a decision process. Ethnography is a good beginning towards this understanding.

We gathered information from our informants about their personal histories and the routine things they do, such as work, visit friends, go shopping or drink at bars. The histories gave us a spatial foundation of residences, schools and other significant events and places for each

informant. Routine activities helped us establish the informants spatial knowledge of the area and gave us a good idea of his activity paths through the area.

Reviewing recent burglaries with the informants helped us learn how they sought out neighborhoods or housing developments to evaluate burglary sites, and then how they choose a specific house from those in the area. We asked each informant to take us along and show us how he would choose a site, as though he were going to commit a burglary. Several informants found it easier to demonstrate for us how they had committed a previous burglary. The result of this was always a wealth of comments and insights into the house burglarized, or to be burglarized and many, many others along the way. Once out on the street, every informant told us of far more sites than we had asked. Many of the sites represent crimes that no one has been charged with.

The chapter devoted to space will detail much of what we learned about spatial exploration, how burglars perceive opportunity and risk in an area, and the importance for some of anchor points to orient their search behavior. While the group of informants from which this information is gathered may not be representative of all burglars, we are confident that as a group they are reflective of the burglars who are

committing the vast majority of burglaries in the areas where they live and work.

Several interesting opportunities arose to borrow from diverse fields in interpreting the information gathered from our informants. Research from the real estate field that describes how those seeking new residences learn about an area and search out available homes offered several interesting parallels.

Every burglar in the course of searching must decide to stop the search and and commit the burglary. This decision requires both picking one of many alternatives for gain, and trying to minimize the risk of being caught. Decision theory stopping rules, such as the marriage rule, helped us compare the way burglars evaluated homes during the search process to various models of decision behavior.

The spatial search process and the information gained from traveling with a burglar to a site presented the opportunity to ask some "what if" questions. These questions are based on our observations and applied to larger questions through the use of models to amplify and replicate the behavior of one or a group of our informants. The most dramatic of these questions may be the effect of a drug sales area on the spatial pattern of burglary in an urban

area. By replicating the spatial bias exhibited by one drug addicted burglar as if he were multiple burglars, or multiple burglaries by the same burglar, we are able to present a very strong picture of how drug sales leads to community deterioration, and how property crime may be the vanguard for the spread of this blight to other nearby neighborhoods.

Burglars have a logic for their actions, a kind of folk wisdom or intuition they use to explain why their actions are sensible and well informed concerning burglary. Burglars can explain why the house they chose is better than its neighbor as a burglary target, why one neighborhood is a better place to prospect than another, and how to best avoid being observed. A vital part of the decision process for every burglar is when to commit the crime.

Time is an important part of the decision process because opportunities for burglary are time specific. The burglar must determine when the house is vulnerable and available to be burglarized if he is to avoid being caught. Every burglar we worked with had their own version of the best time to commit burglary. We found a great diversity in their opinions and approaches, and all of them seemed to work.

The time the informants we worked with choose for burglary is also a reflection of how they organize and use their non-criminal time. We gathered information on time use that went far beyond when to commit burglary. We found that time use was not only an important part of the decision process, but also an important indicator of our informants' life styles.

The information we gathered on time use included the time needed to search for a burglary site, the time needed to plan and execute a burglary, and the effect of the time burglary takes on the rest of the burglars daily activities. We gathered information on the daily routines of each of our informants in the form of daily diaries. We tried to follow their daily activities when active committing burglaries and when working or not involved in crime.

The analysis of this information helped us understand the lifestyle of our informants and gave added depth to our understanding of their decisions. The chapter on time that follows will review many aspects of these lifestyles. For many of our informants, burglary became a career choice that precluded legal employment because of the length of time they devoted to it during normal business hours when most of us are at work. Burglary seemed to be the way other informants paid for a lifestyle that allowed them the

maximum freedom to do as they pleased, including not responding to the normal time use conventions. Indeed, some informants with drug dependencies often would not sleep for days at a time.

As we learned more about the relationship of burglary and time use we began to gather information on the work history of our informants. Their employment backgrounds closely parallel what we learned from the time diaries. The chapter on time illustrates graphically how time use is an indicator of routine changes in the criminals' lives, and how these changes can provide important indicators for probation and parole officers. The potential for intensive supervision to be used successfully is discussed because of its potential to monitor and change time use patterns.

Spatial Aspects of Residential Burglary

Residential burglary is an excellent 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.

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

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

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 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 individual. 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.

TABLE 2: Information Sources Used in Burglary

Source Type (percentage of burglars who use each type)

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

Less active burglars may even rely on inside or informal sources of information. These less active burglars may be the most professional who are very selective and only burglarize targets they know contain valuables of great worth. 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 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. 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. They are 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 (1970) 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, 1975).

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 "Hockessing houses," referring to an area of New Castle County well known for its affluence. "Those houses look like Hockessing 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. 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 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, 1975, 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, 1975). 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, 1975).

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 $(r + 1)^{th}$ 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, 1975). 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

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

where x_i is the value of the ith 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:

$$S_{x*} (x-x^*) \ f(x) \ d_x = c$$

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 burglar's search processes. A closer look at the residential search process from the burglars 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 several 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. After collecting cash, silver, guns and other valuables, he fences the goods for drugs.

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.

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.

The implications of these findings for corrections professionals are apparent. Burglars whose behavior resembles models which involve recall obviously spend a great deal of time selecting a burglary site. This time generally comes out of the middle of a typical work day (Rengert and Wasilchick, 1985).

Individuals on probation or parole for a previous burglary conviction should be strongly encouraged to hold down a _daytime_ job when most homes are unoccupied in upper income communities. This could be made a

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	43%	28%	28%
Drug Free	25%	25%	50%
used car	30%	20%	50%
on foot	40%	40%	20%

requirement of a parole plan. Those individuals who
quit a job without cause or are fired for absenteeism
require close supervision to determine what they have
substituted for their work time.

Intensive supervision is called for when the signs
of reverting to an old practice of time use becomes
apparent rather than being assigned to specific
convicts at the time of release. In other words,
changes in daily habits of time use may be used as a
guide for the probation officer as to when intensive
supervision is desirable or needed, rather than wasting
this effort on convicts who are obviously changing
their lives. We recommend more flexibility to allow
corrections professionals to assign convicts to various
levels of supervision as the need requires rather than
having judges assign convicts to programs which may not
be necessary at particular stages of the corrections
process. We will deal with this topic in more detail in
the next chapter. The question now turns on the spatial
pattern of burglaries which result from these spatial
search processes.

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 (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 several 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

FIGURE 1

Hypothetical Spatial Patterns

a.
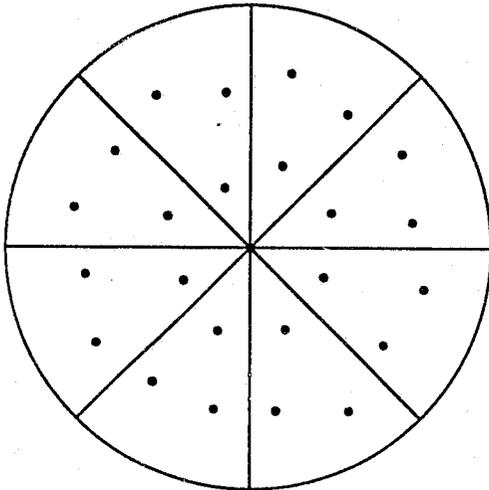
Uniform Pattern

b.
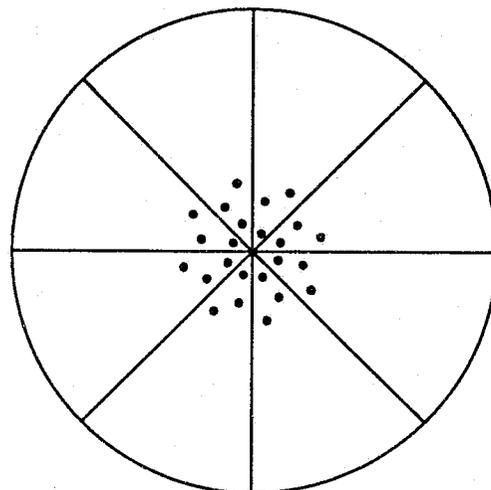
Distance Bias

c.
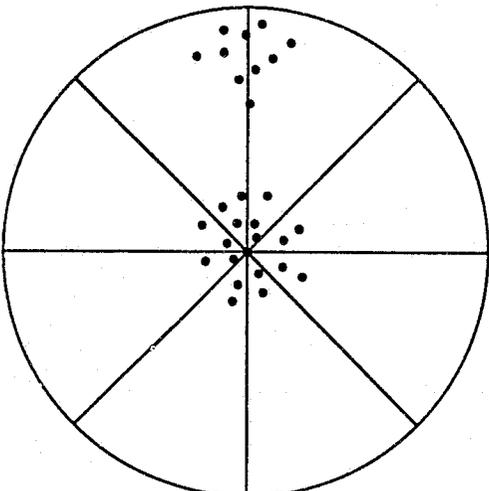
Bimodal

d.
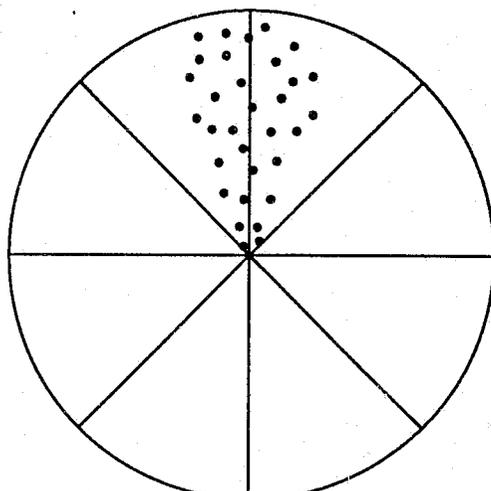
Directional Bias
(or Teardrop)

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 subjects 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).

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 subjects of our study are examined to see which model best describes their spatial pattern. We use an area

FIGURE 2

"Fished Out" Attraction Area

"Fished Out" area
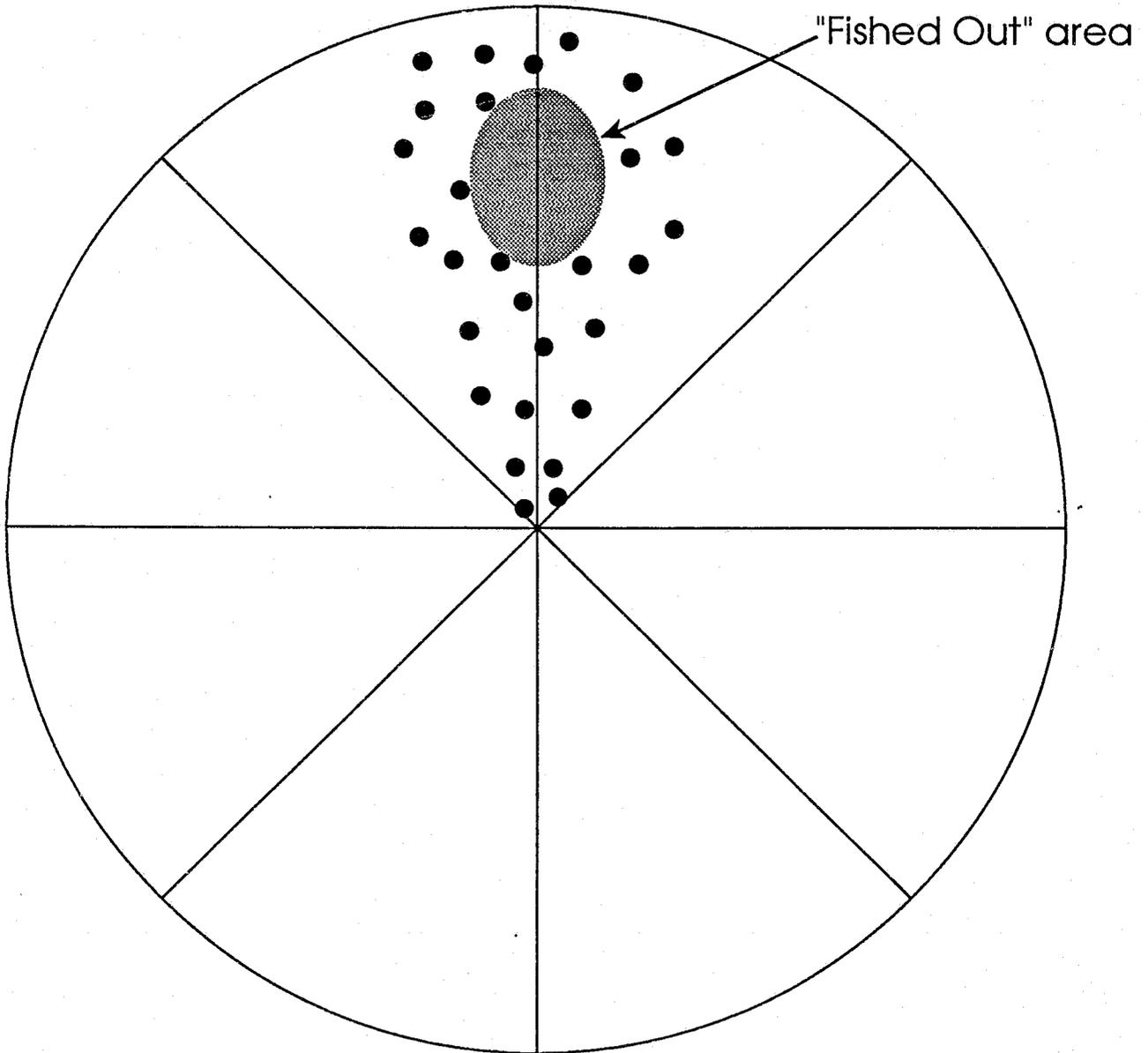
based model in which the probability of committing a burglary in identified areas is examined. The study areas are identified by drawing a circle about the home of each burglar. The radius is the distance to the farthest burglary committed by the burglar. A straight line is drawn between the home of 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. Ten opportunities are picked for each circle and assigned a 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 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 ith area

    $N = 16 =$ the number of areas

Home oriented distance decay:

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

N is the number of burglary opportunities; d_i is the distance between the home and the ith burglary opportunity.

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

FIGURE 3

Suburbs=180°

225°   13   12   135°

14   5   4   11

6   3

270°   90°

7   2

15   8   1   10

315°   16   9   45°

CBD=0°
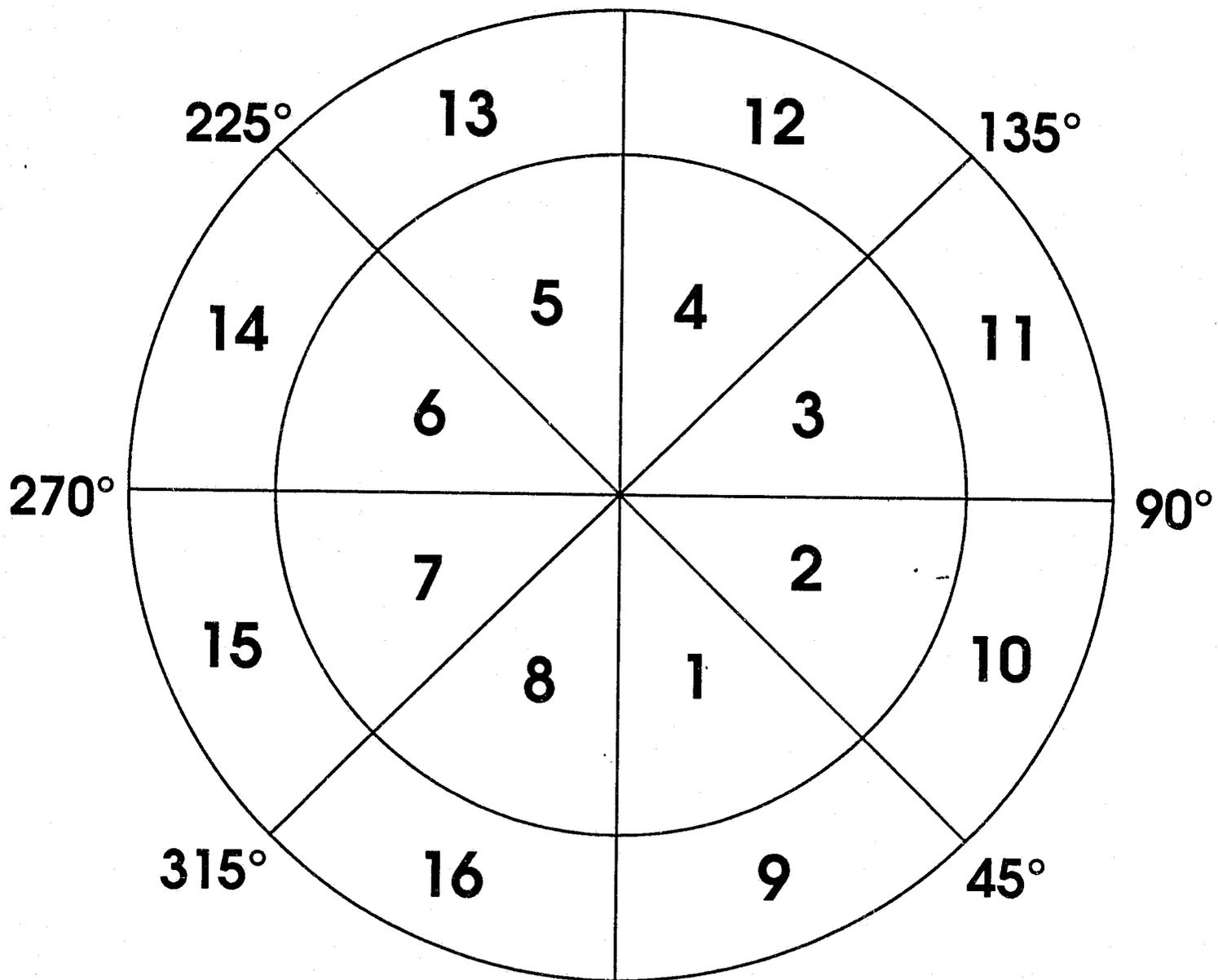
e is the exponential function

α is the empirically defined distance decay function.

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

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

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:

$$p_i = u \left[(e - \alpha_1 \, d_{i1}) / \sum\limits_{j \neq i}^{N} e - \alpha_1 \, d_{j1} \right]$$

$$+ (1-u) \left[(e - \alpha_2 \, d_{i2}) / \sum\limits_{j \neq i}^{N} e - \alpha_2 \, d_{j2} \right]$$

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 ith

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.

$\alpha 1$ and $\alpha 2$ 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 $\alpha 1$ equals $\alpha 2$. 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 $\alpha 1$ and $\alpha 2$ 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. Notice that the Philadelphia burglars (first five burglars) have much
larger distance decay parameters than suburban bur-
glars (last five burglars) This means that their crime sites are much more
clustered about an anchor point than is the case in the Wilmington and
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 (suburban)
burglars have a larger distance decay parameter for
their home location than for their drug sales locations
(Burglars A and D). All urban drug using burglars
cluster their crimes around drug sales locations more
than around their homes. When we center a protractor on
the home locations of Philadelphia drug using burglars
and set the zero axis 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

TABLE 4: Estimated Parameter for Models

Burglar Y	B_1	B_2	U
home	8.464		
drug		10.217	
bimodal	8.380	9.930	-.001
teardrop	3.720	-6.004	

Burglar G

home	2.862		

Burglar E

home	4.659		
drug		5.727	
bimodal	4.657	5.725	-.927
teardrop	.093	.114	

Burglar M

home	2.850		
drug		3.554	
bimodal	2.337	3.253	.000
teardrop	4.553	2.122	

Burglar C

home	3.938		

Burglar R

home	6.621		

Burglar K

home	1.898		

Burglar L

home	2.810		

TABLE 4: Estimated Parameter for Models (continued)

Burglar V

home	.974		

Burglar R

home	4.580		

Burglar T

home	1.339		
drug		3.335	
bimodal	1.259	2.971	1.002
teardrop	-.150	3.710	

Burglar A

home	2.573		

Burglar D

home	1.161		
drug		1.053	
bimodal	.695	1.053	.000
teardrop	.394	.695	

Burglar B

home	1.228		
drug		1.011	
bimodal	1.226	.913	-.447
teardrop	.381	.699	

Burglar Z

home	1.773		
drug		1.863	
bimodal	1.771	1.861	-.001
teardrop	-.154	2.022	

FIGURE 4

Burglary Locations Mapped on the Home to Drug Sales Axis

10,000 ft

10,000 ft

← Direction
Toward Drug Sale
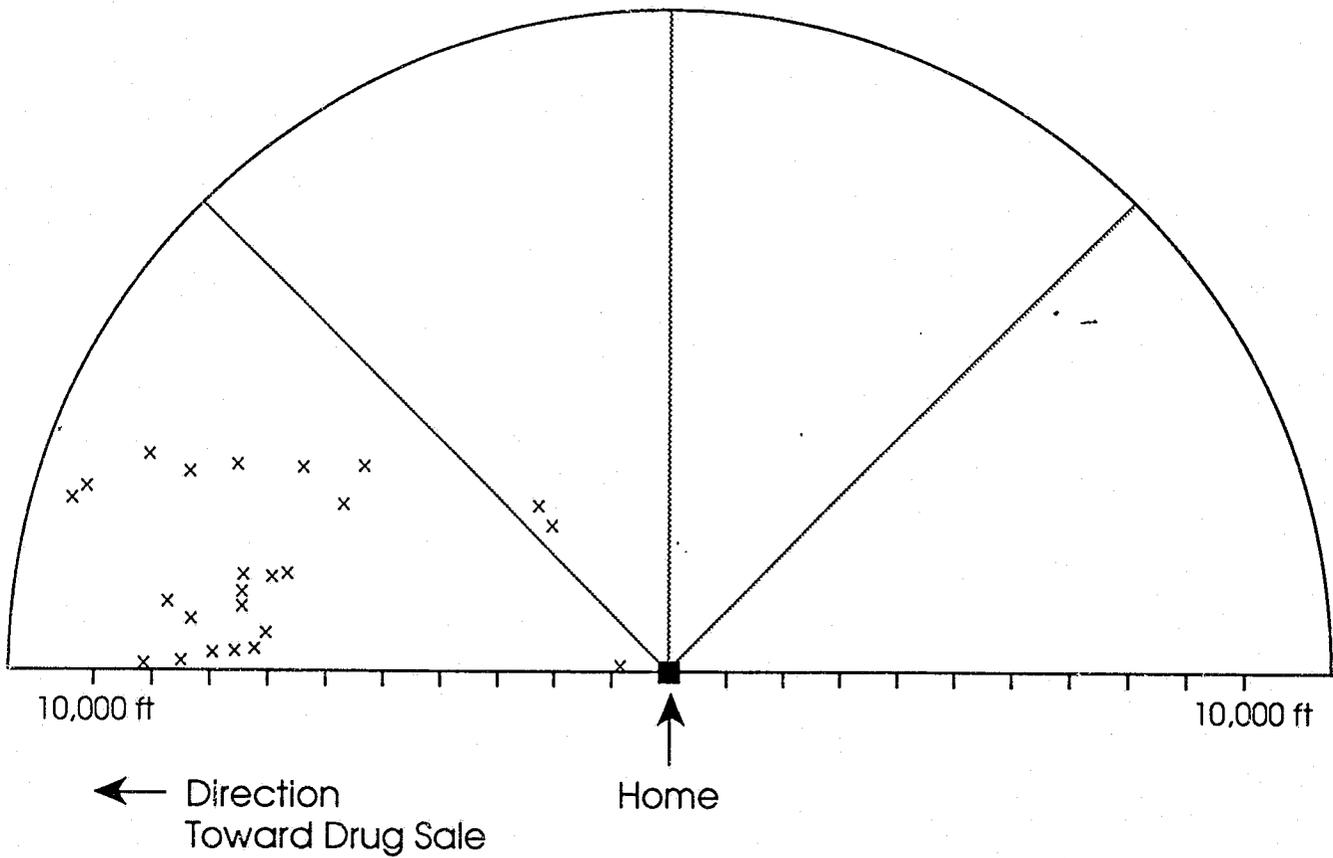
Home

FIGURE 5

Burglary Locations Mapped on the
Drug Sales to Home Axis

10,000 ft   10,000 ft

←— Direction   Drug Sales
Toward Home   Location
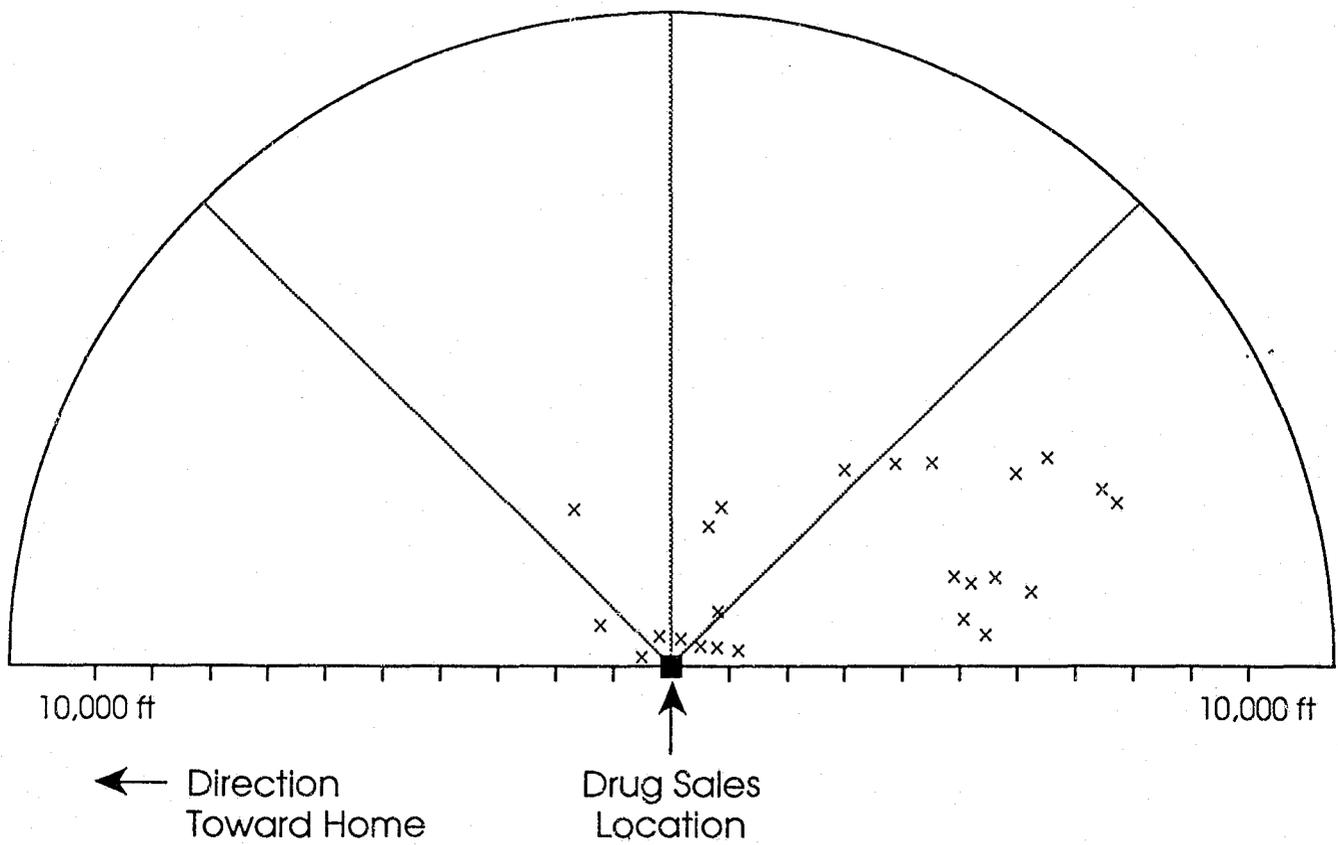
drug dependent burglars (Figure 5). Figure 6 illustrates the location of burglaries with respect to the home for Philadelphia drug dependent burglars. Figure 7 illustrates the change in this pattern when the map is centered on the drug sales area for these burglars. The attraction of drug sales areas 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 1. 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.

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

FIGURE 6

Orientation of Burglaries
About the Home of the Burglar

CBD


```
        .00      ✗ ✗  .10          .00          .00          .00
             ✗ ✗✗✗  ✗     ✗

        .00          .19          .05          .00          .00

                          ✗  ● Home
            ✗✗✗
        .10 │✗          .10          .05          .00          .00

                          ✗
                          ✗

        .00          .00      ✗  .14          .00          .00
                          ✗

                       ✗
                      ✗ ✗
        .00          .05 │✗✗          .24          .00          .00
```

Each square is
approximately
5 city blocks wide

Suburbs

FIGURE 7

Orientation of Burglaries
Toward Drug Sales Location

CBD

```
        .00          .00          .00          .00          .00


        .00          .00          .00          .00          .00


                              Drug Sales Location
        .00          .19          .33          .05          .00


        .00          .00          .24          .00          .00


        .00          .00          .19          .00          .00
```
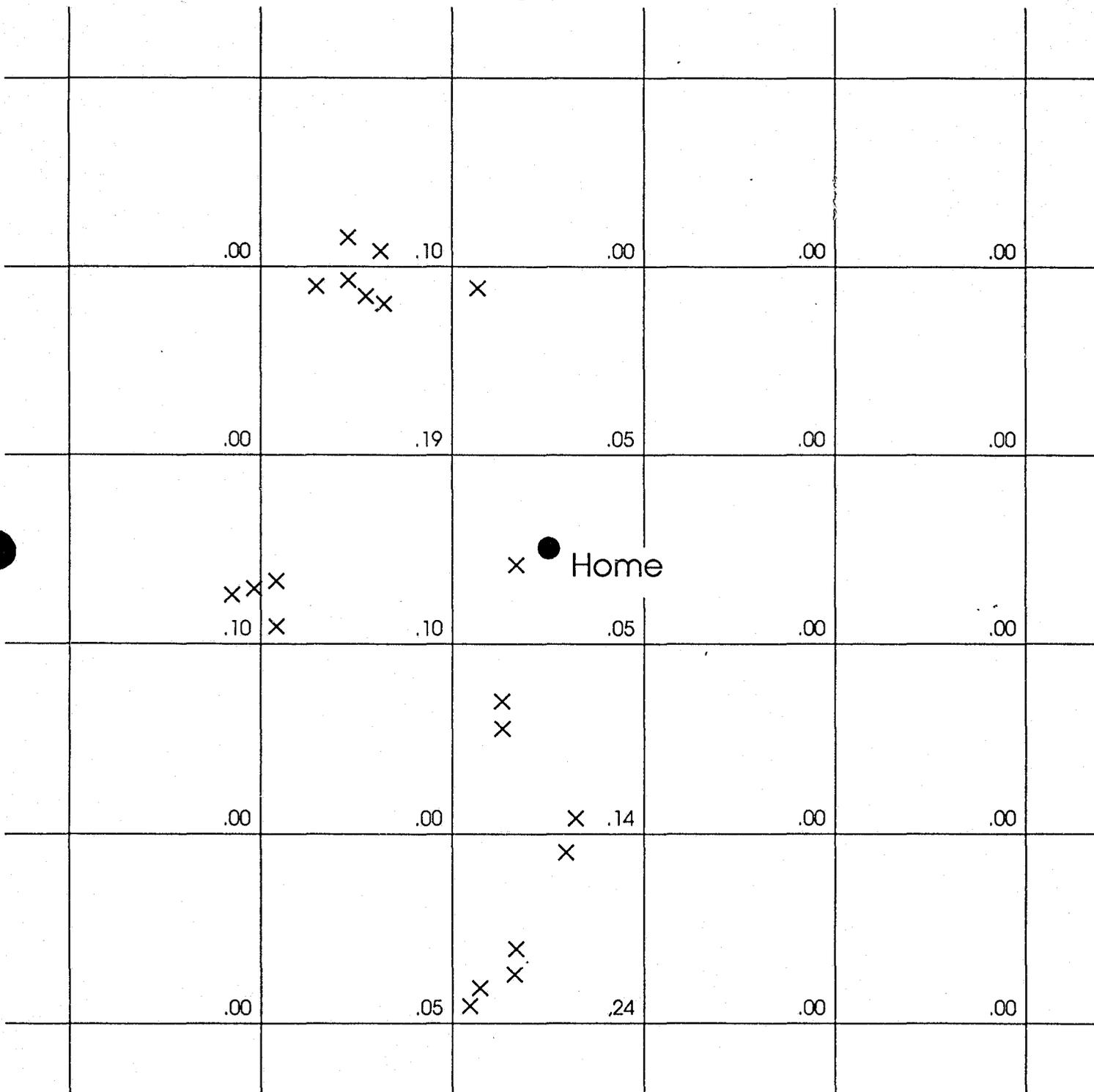
Suburbs

a better predictor than the logit model based on the home of the burglar in every case but one. It is a 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 often does spatial exploration rather than stop at the first opportunity. The teardrop model best predicts this burglar's spatial pattern of burglaries.

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

Burglar	Home Uniform Patten	Drug Uniform Patten	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.

To begin, lets postulate a hypothetical model of
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 hypothesize a simple model that will clarify this relationship and suggest certain policy implications for combating the interrelationship of drugs and crime.

Evolution of a Drug Market Place

In our hypothetical 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. 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 friend 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. It may be illustrated by temporary agglomerations of youth at parties and hangouts as follows in Figure 8.

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

FIGURE 8

Casual Non-Place Specific Market

Time 1   Time 2   Time 3
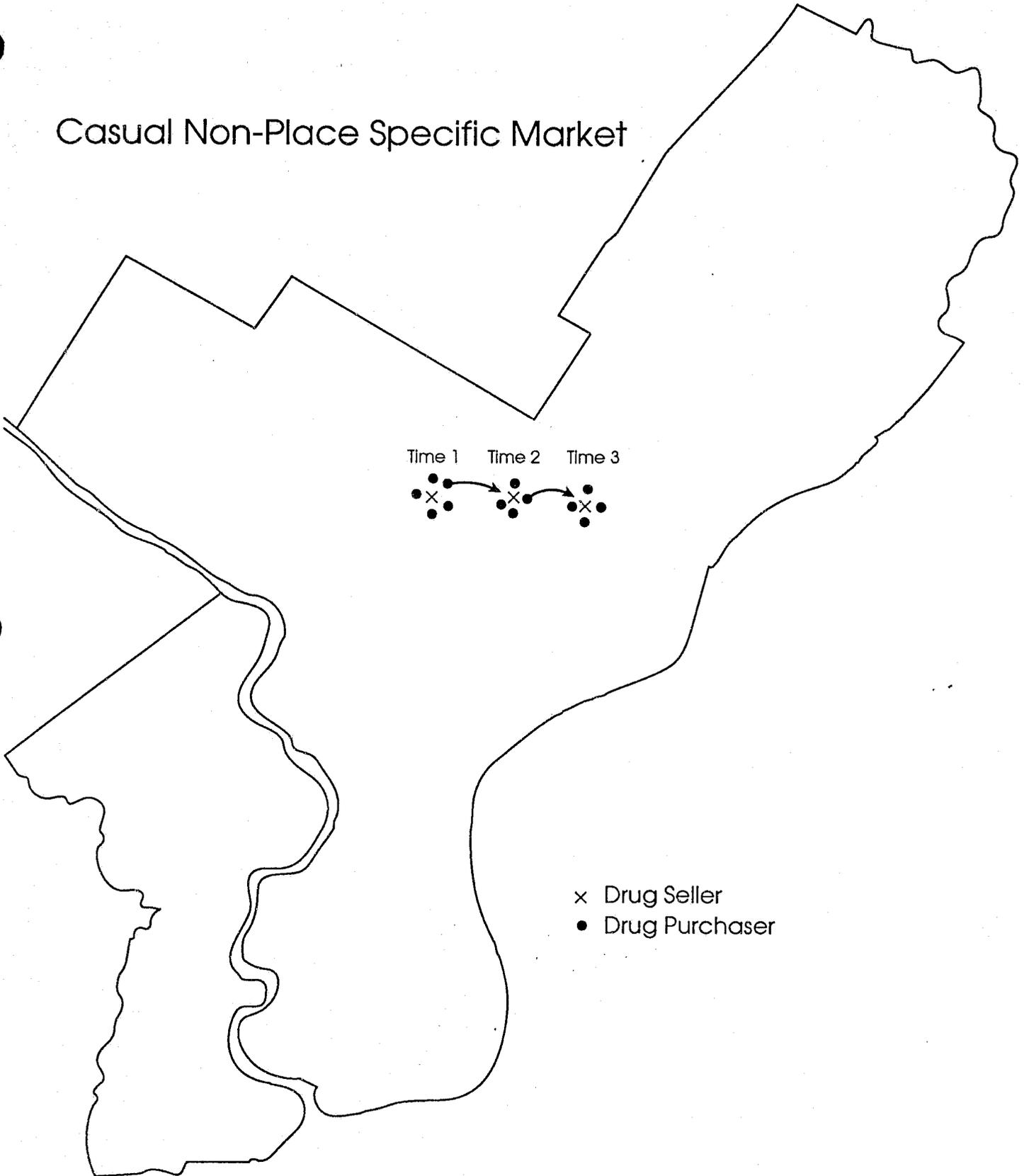
× Drug Seller
● Drug Purchaser

friends are introduced to 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.
Market demand is not yet strong enough to support a
full time seller at a permanent location.

Stage 3: Regular Street Sales Begin

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

FIGURE 9

Periodic Market

Time 1

Time 2

Time 3
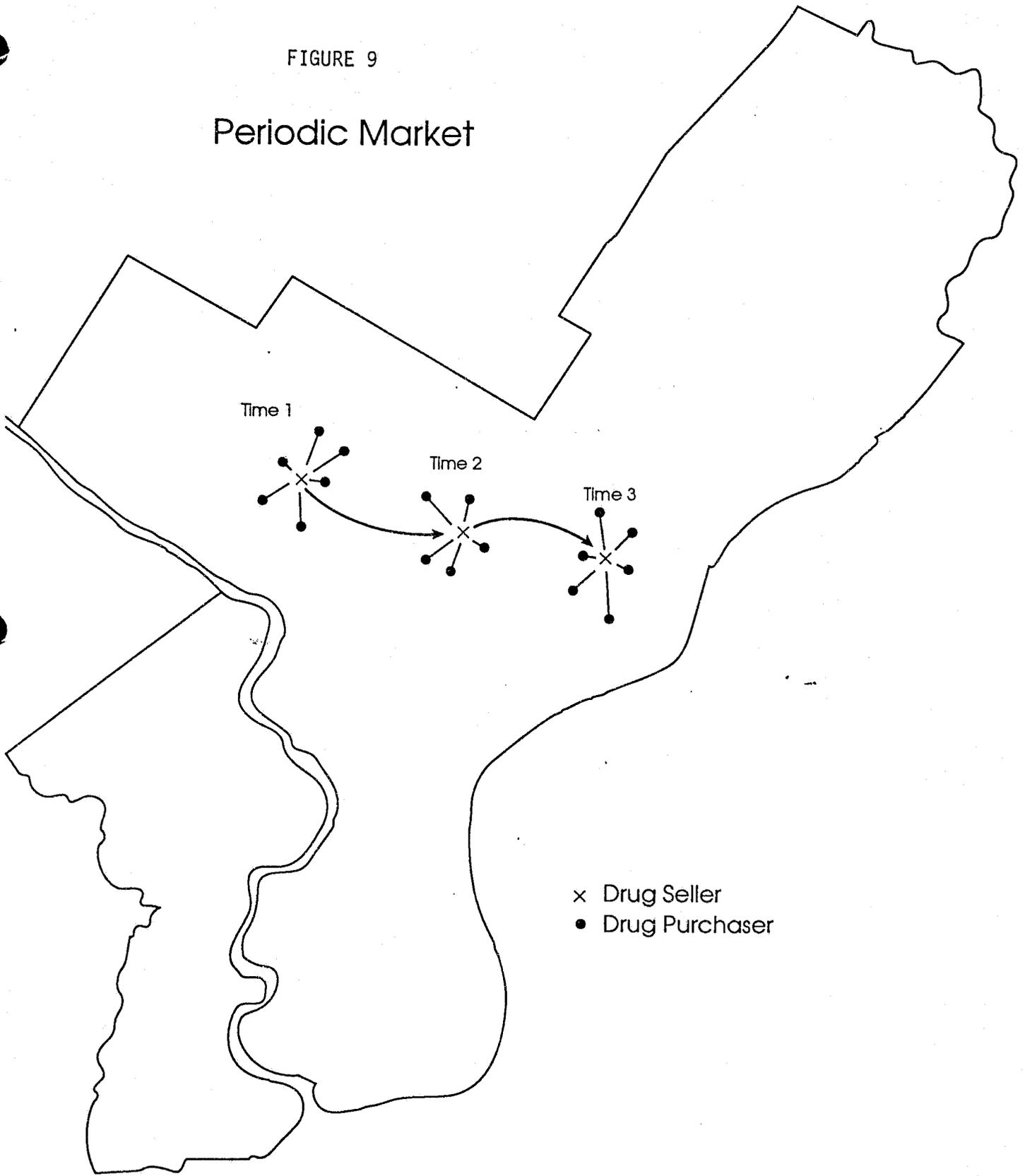
× Drug Seller
● Drug Purchaser

supplier who is operating in their neighborhood. This is generally a deteriorating neighborhood along a transportation artery dominated by rental housing, industry, or an uncontrolled local park.

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 have to enter a local bar (or even leave their cars) to purchase drugs. They just make their way to the suppliers location and make their wishes known. Word of mouth advertising expands the range of sales as customers come from surrounding communities to purchase drugs. Full time sellers are employed as sales expand.

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 (1981) 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

FIGURE 10

Regular Street Sales

Time
1, 2, & 3

× Drug Seller
● Drug Purchaser
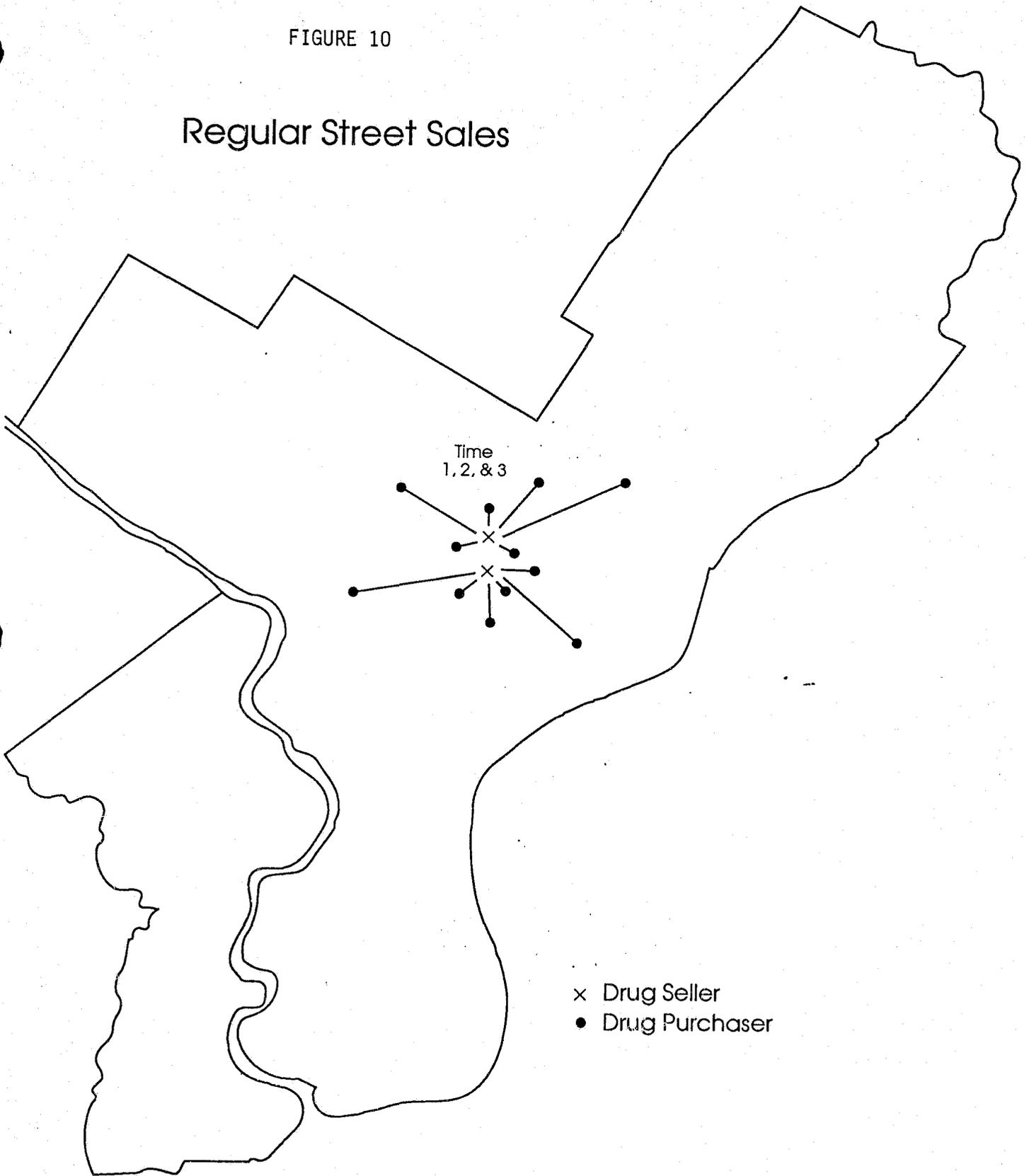
homes. Prospective home owners are reluctant to purchase homes in high crime neighborhoods. This also reduces the remaining neighbors ability to resist drug distributors and crime as the more stable members of the community move out.

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 corners. 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. Advertising will still be largely by word of mouth. Crime will focus on this area to such an extent that it will verge on being

a persistent high crime area (Schuerman and Kobin, 1986).

Stage 4: Drug Mart

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 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.

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: buy "yellow tape" cocaine which is sold by the largest distributor in the area. TV spots illustrate how you can drive up, role down your window and bargain for drugs. 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.

This is why we term this stage 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 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

FIGURE 11

Drug Mart
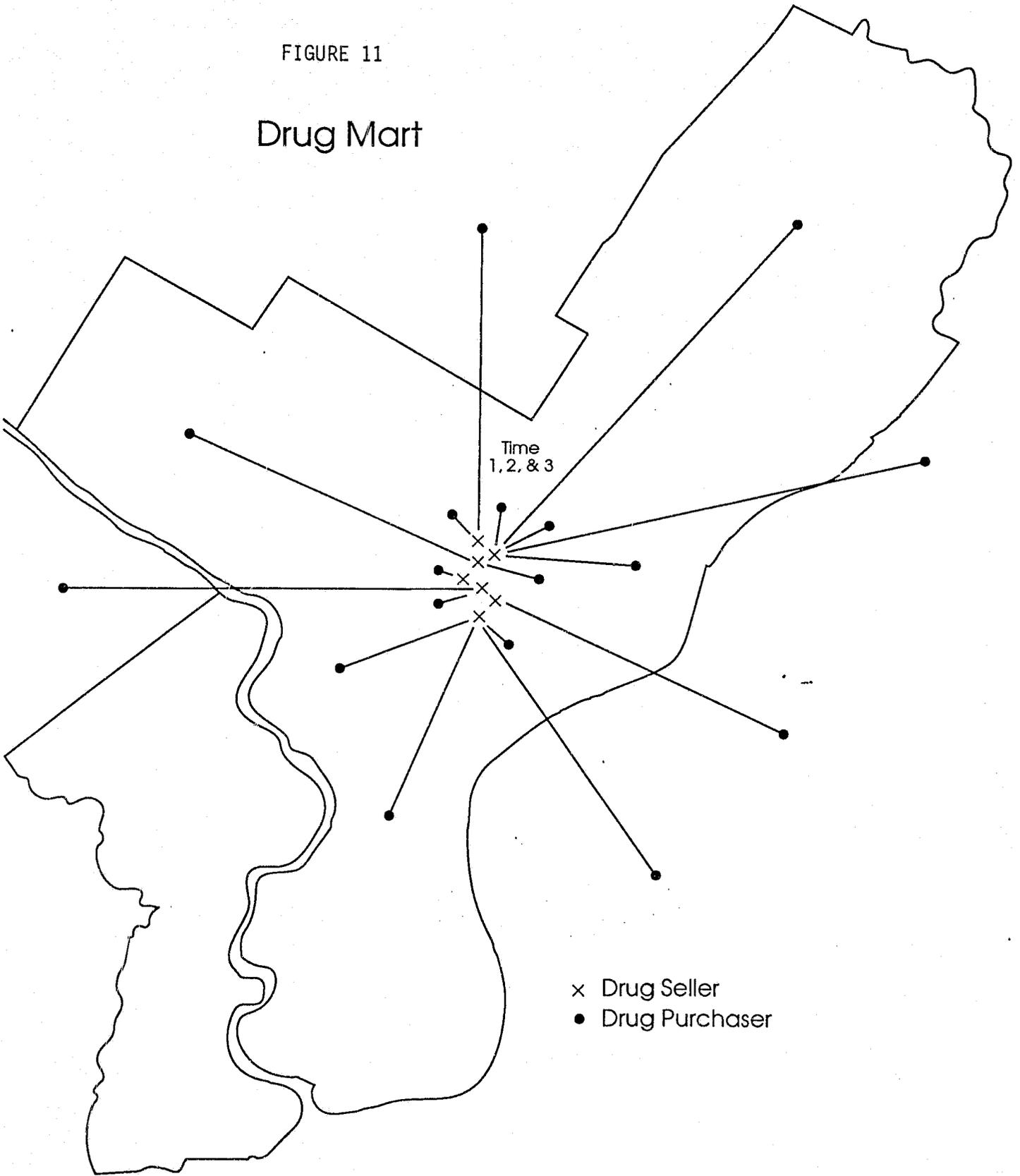
Time
1, 2, & 3

× Drug Seller
● Drug Purchaser

studies such as ours are necessarily limited in scope
due to time and 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.

FIGURE 12
Orientation of Burglaries
Toward Drug Sales Location

CBD

.00	.00	.00	.00	.00
.00	.00	.00	.00	.00

Drug Sales Location

.00	.19	.33	.05	.00
.00	.00	.24	.00	.00
.00	.00	.19	.00	.00
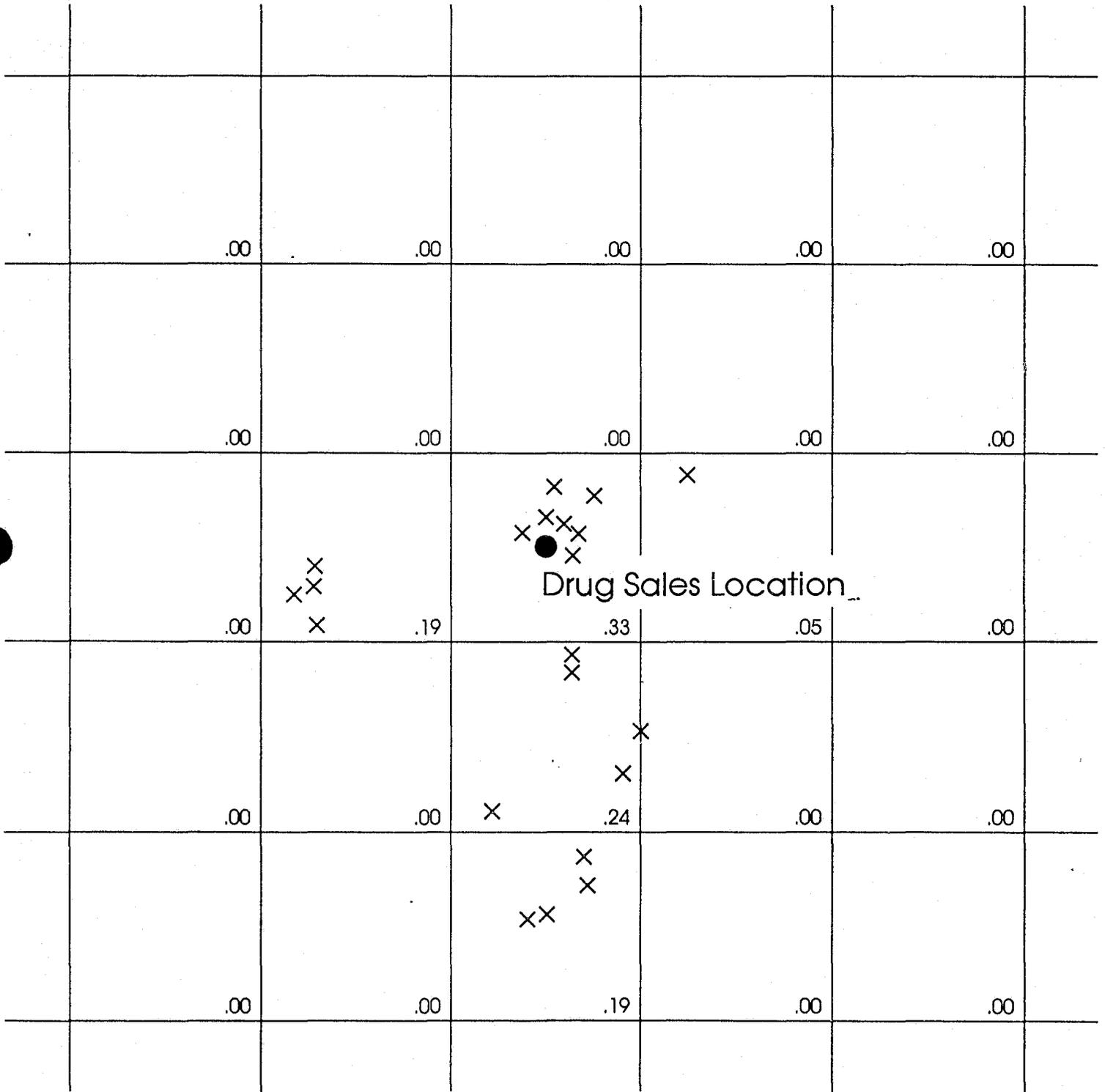
Suburbs

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 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

FIGURE 13

Orientation of Burglaries
About the Home of the Burglar

CBD
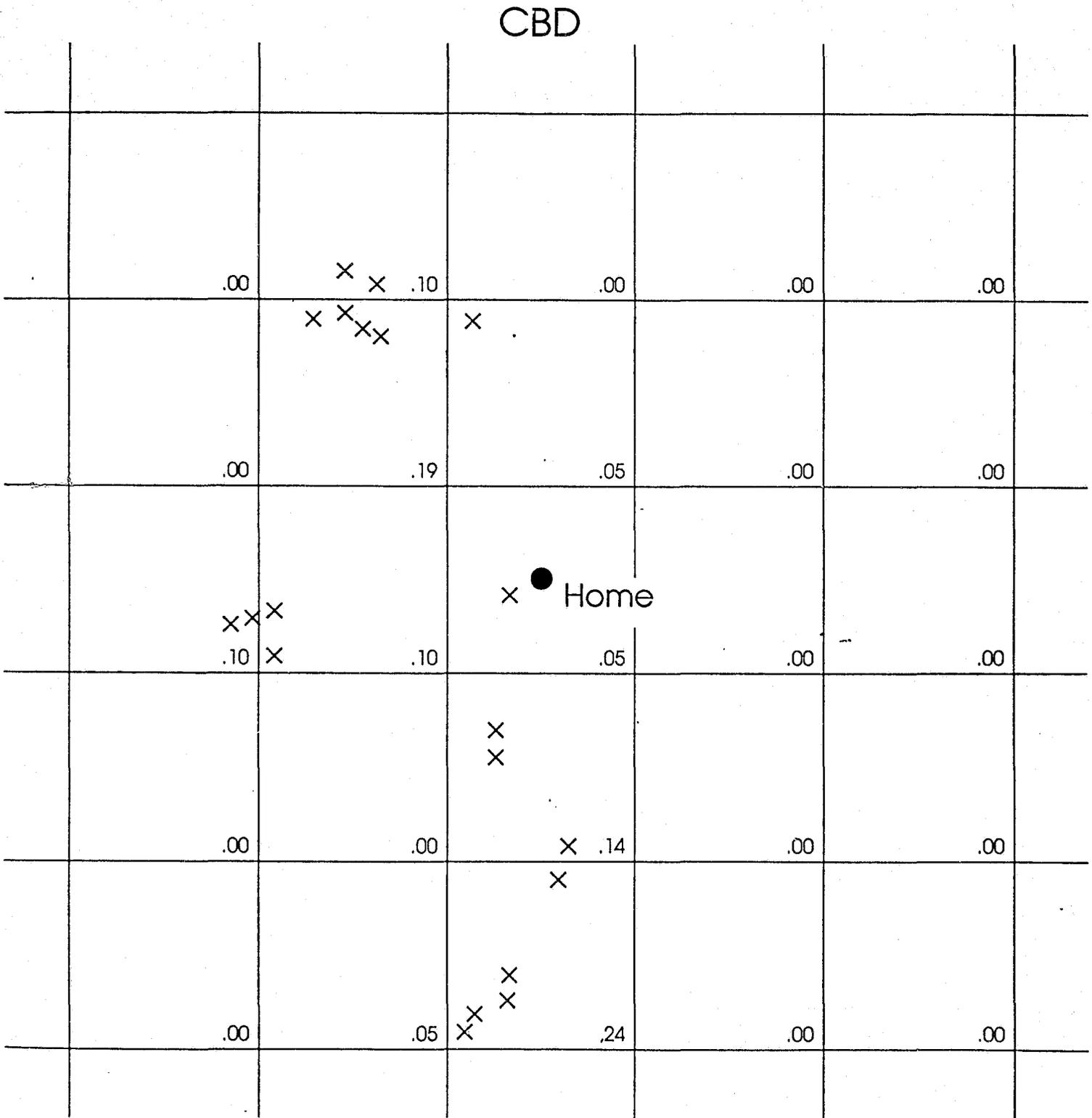
Each square is
approximately
5 city blocks wide

Suburbs

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. 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 that 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

Figure 14

```
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   1   0   0   2   1   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   1   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   99  99  0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   1   82  106  2   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   2   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   2   1   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   1   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
```

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.

Policy Implications

Several important policy implications are
suggested from this analysis. Rather than listing them
systematically, we will deal directly with those we
feel most strongly about.

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

Figure 15

```
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  7  3  0  1  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  5  1  1  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
```

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.

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.

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. 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 cooperation·in

their war on drugs. It certainly will make the street

sellers less accessible and therefore, less profitable.

Attacking the drug supply market place at its core

will be disruptive and drive up the cost of doing

business. The drug user should also begin to pay a

higher economic and social cost. 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 should be standard procedure (Stelwagan,
1985). In some jurisdictions, confiscation of real
estate is possible. 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 all 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.

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.

FIGURE 16

Spatial Extent of Personal Island:
Daily Possible Use of Space

Time

Walker

Driver

Working
Walker

Working
Driver

Space
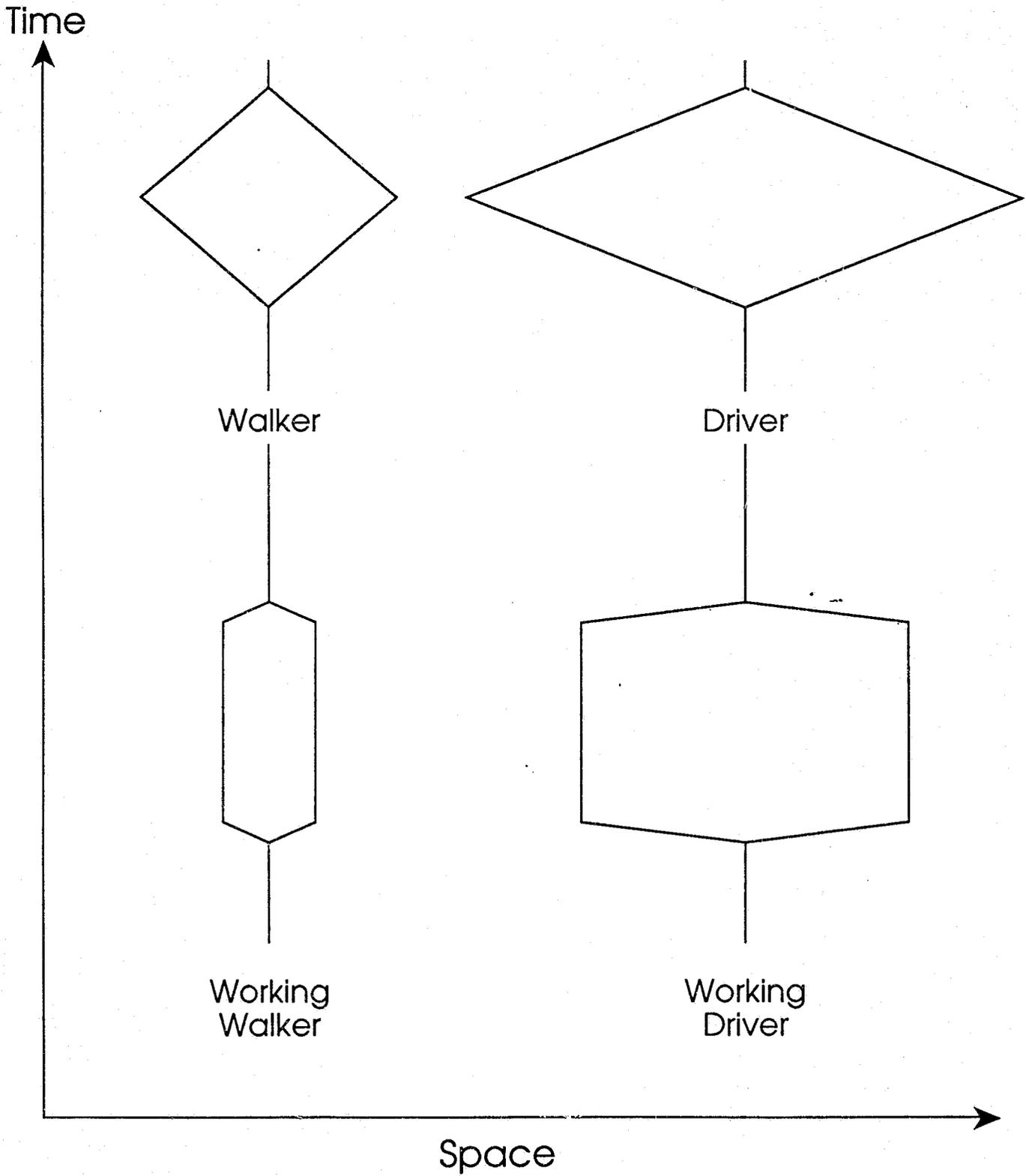
after Hagerstrand, 1970

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 is 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).

Next, we 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 burglars we have worked with, a clear picture emerges of what is possible and what is not possible while employed or while doing crime.

These data derive from two daily diaries we asked each burglar to construct. 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 a day when they commit a burglary. The second is a diary of half hour blocks of time for a 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 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.

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 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
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.

FIGURE 17

CRIME DAY: Aggregate Time Used for Television

FIGURE 18

WORK DAY: Aggregate Time Used Watching Television

FIGURE 19

CRIME DAY: Aggregate Time Used Partying

FIGURE 20

WORK DAY: Aggregate Time Used Partying
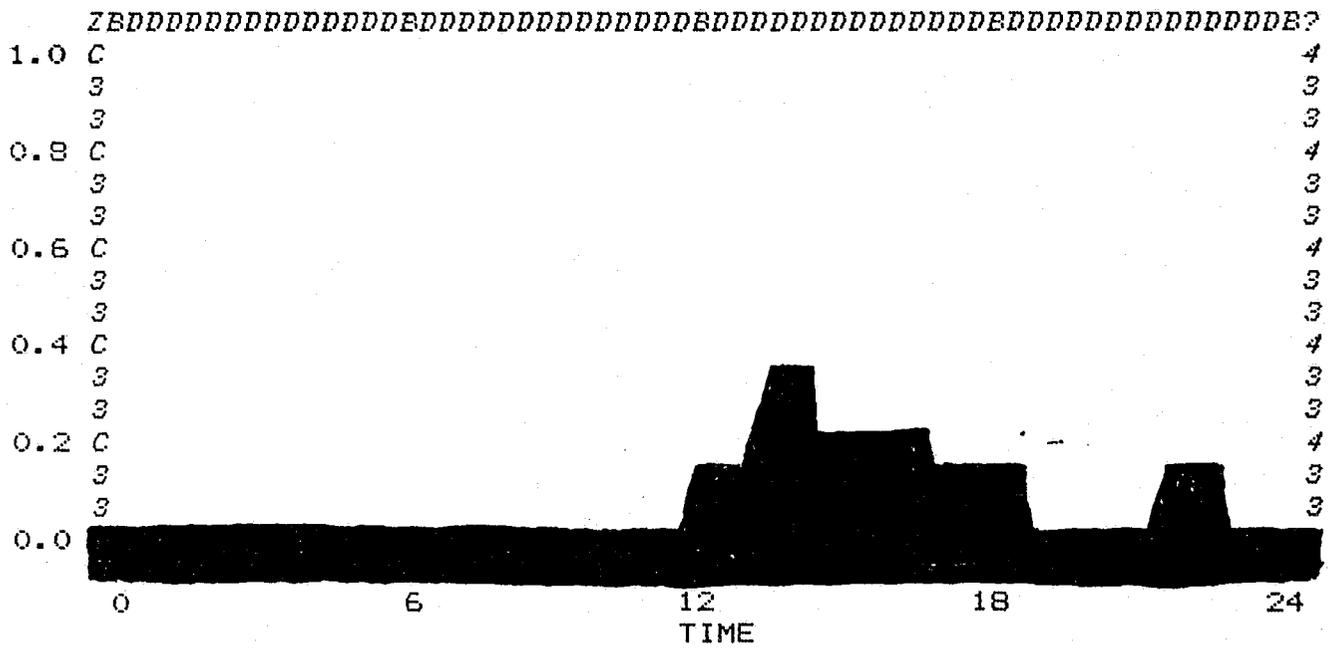
Shopping was a term used by some burglars to describe an activity that was usually leisure, and might better be called "hanging out at the malls." Only suburban burglars engaged in this activity regularly enough to mention it in a diary. The difference between a crime day and a working day is striking 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 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.

FIGURE 21

CRIME DAY: Aggregate Time Used Shopping

SHOPPING

FIGURE 22

WORK DAY: Aggregate Time Used Shopping

SHOPPING

```
        ZBDDDDDDDDDDDDDDDDBDDDDDDDDDDDDDDDDDDDDBDDDDDDDDDDDDDDDDDDBDDDDDDDDDDDDDDDDDB?
  1.0   C                                                                          4
        3                                                                          3
        3                                                                          3
  0.8   C                                                                          4
        3                                                                          3
        3                                                                          3
  0.6   C                                                                          3
        3                                                                          4
        3                                                                          3
  0.4   C                                                                          3
        3                                                                          4
        3                                                                          3
  0.2   C                                                                          3
        3                                                                          4
        3                                                                          3
  0.0                                                                              3
        0            6              12            18            24
                                    TIME
```
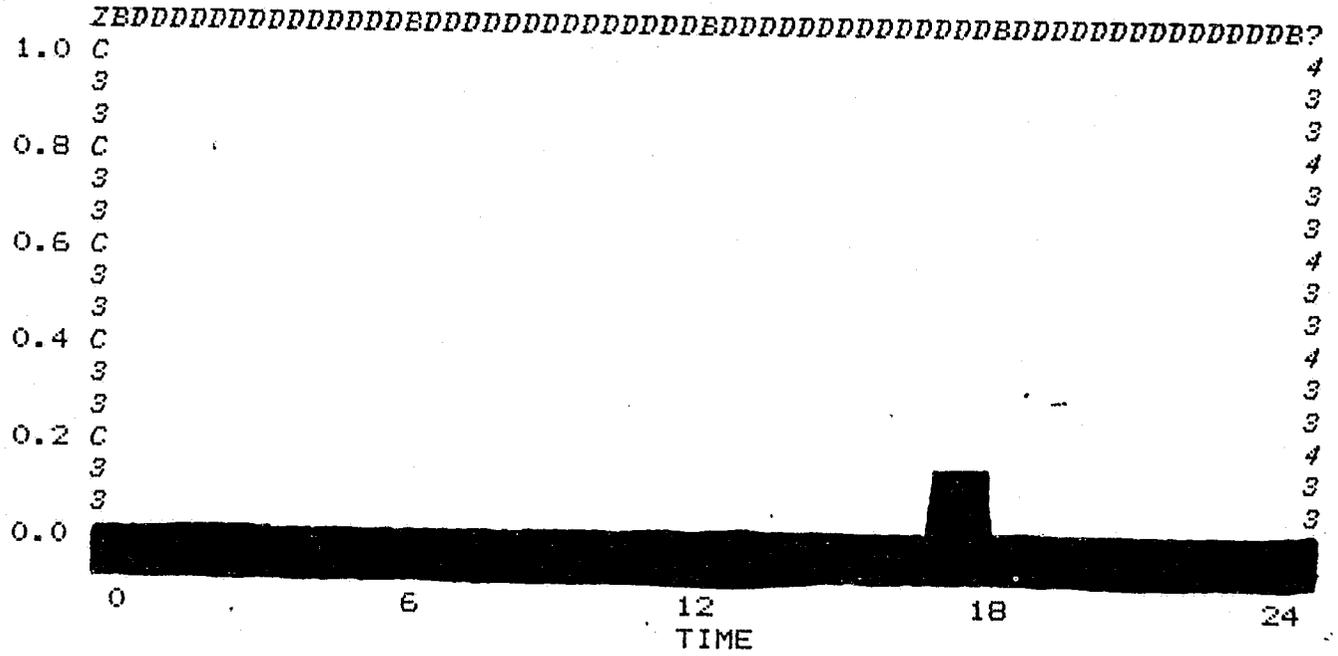
Crime days are very different. The majority do not get out of bed before noon. A few nap between one in the afternoon and nine in the evening. None went to bed for the night before eleven o'clock, and most did not go to bed before two o'clock in the morning. Everyone was asleep at five o'clock in the 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, 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 fourty 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 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.

FIGURE 23

WORK DAY: Aggregate Time Used Sleeping
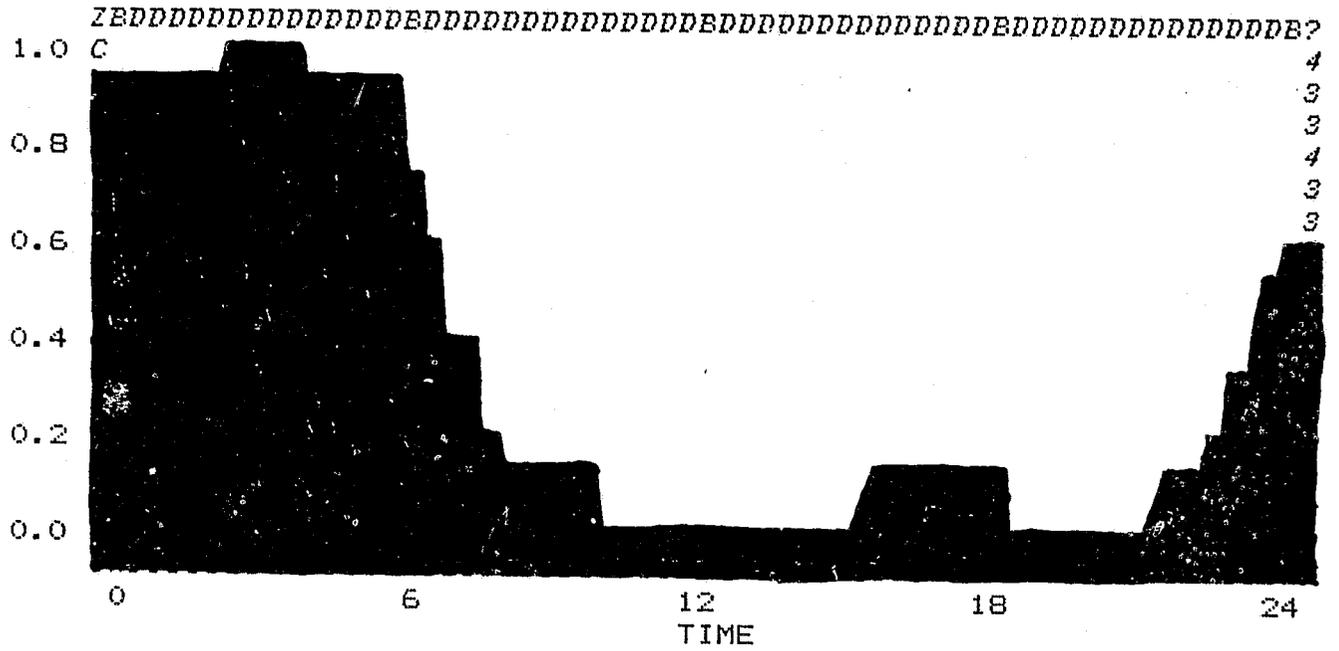
FIGURE 24

CRIME DAY: Aggregate Time Used For Sleeping
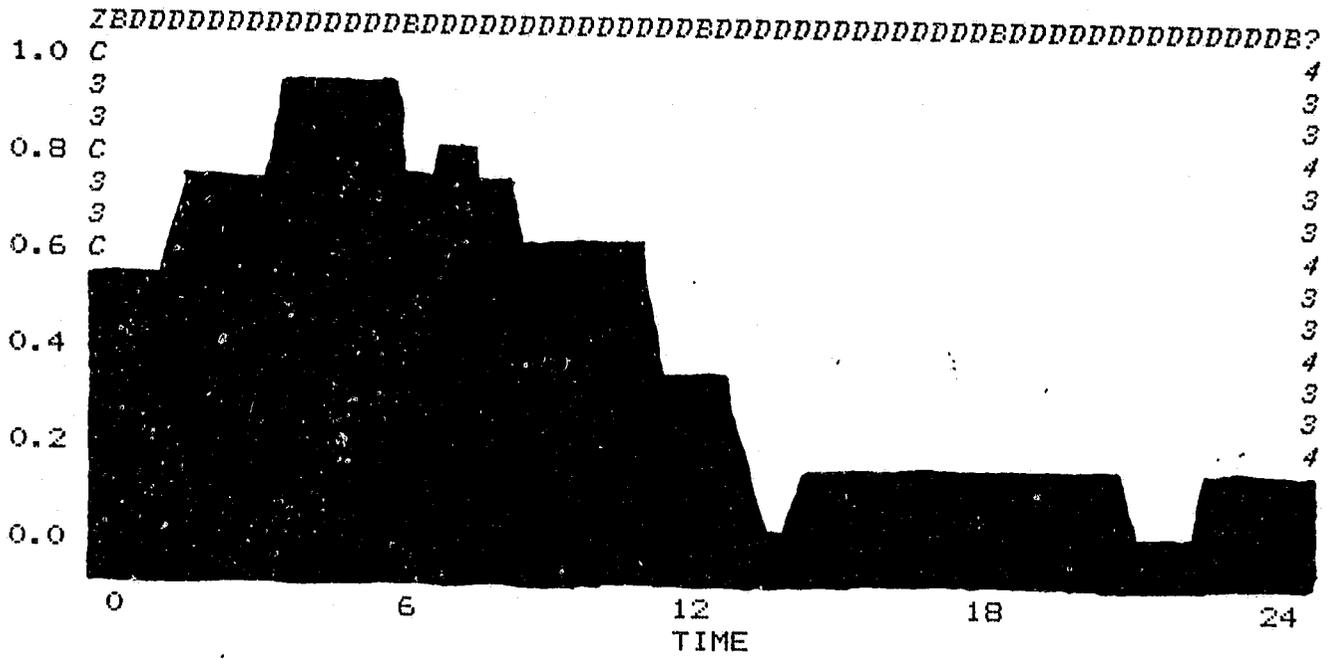
FIGURE 25

WORK DAY:Aggregate Time Used Eating

FIGURE 26

CRIME DAYS: Aggregate Time Used for Eating
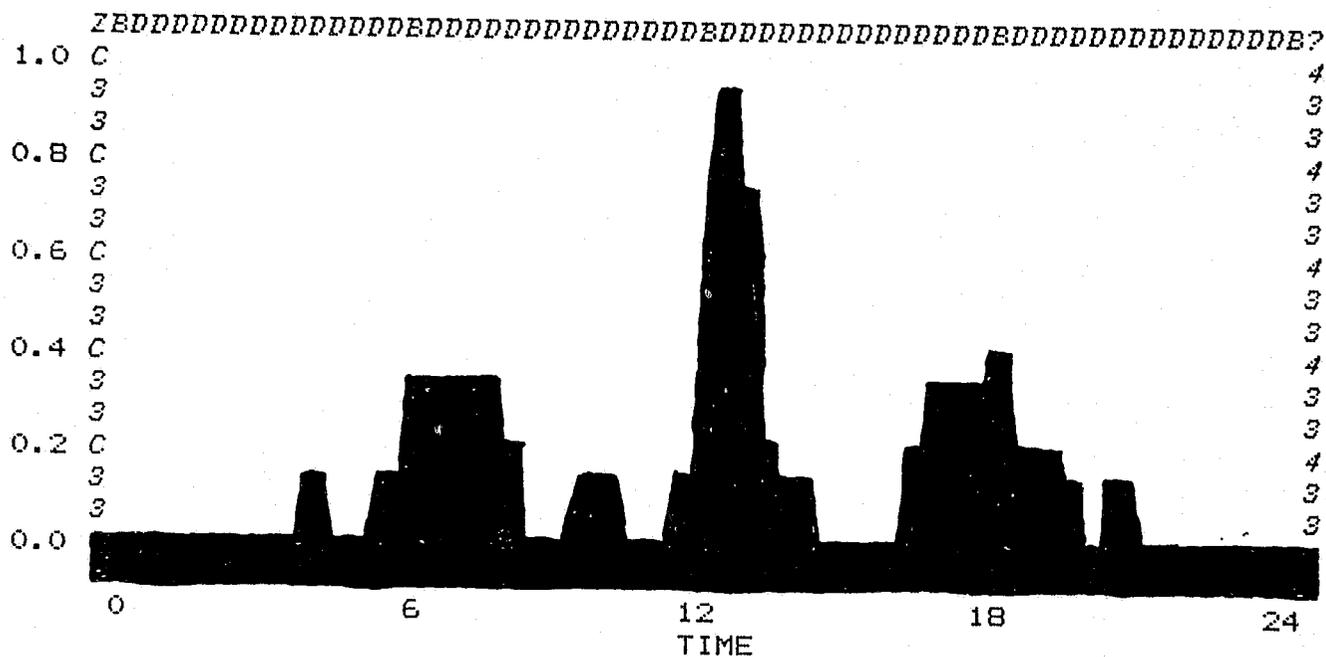
This brings us to the final two activities we considered -- work and crime. These two activities are considered together because they are very often traded off against each other. As demonstrated in our previous research, a very active criminal can neither be employed (because of capability constraints 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 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.

FIGURE 27

WORK DAY: Aggregate Time Used Working
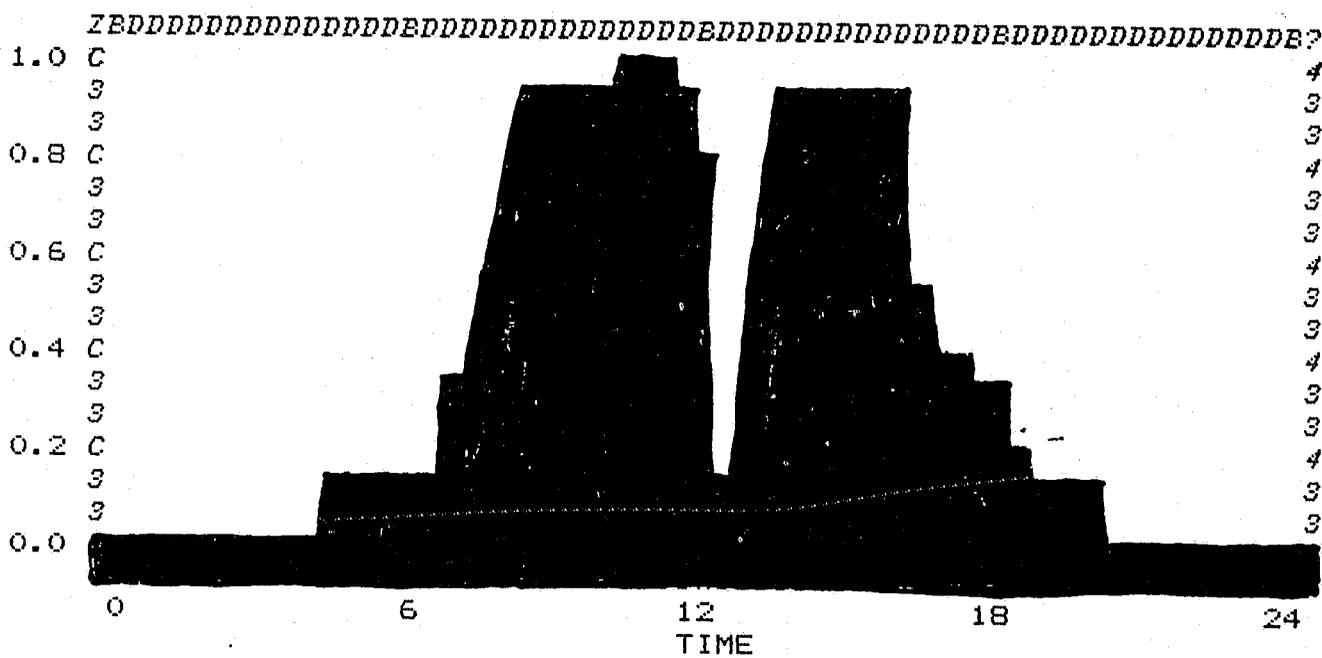
FIGURE 28

CRIME DAY: Aggregate Time Used For Burglary
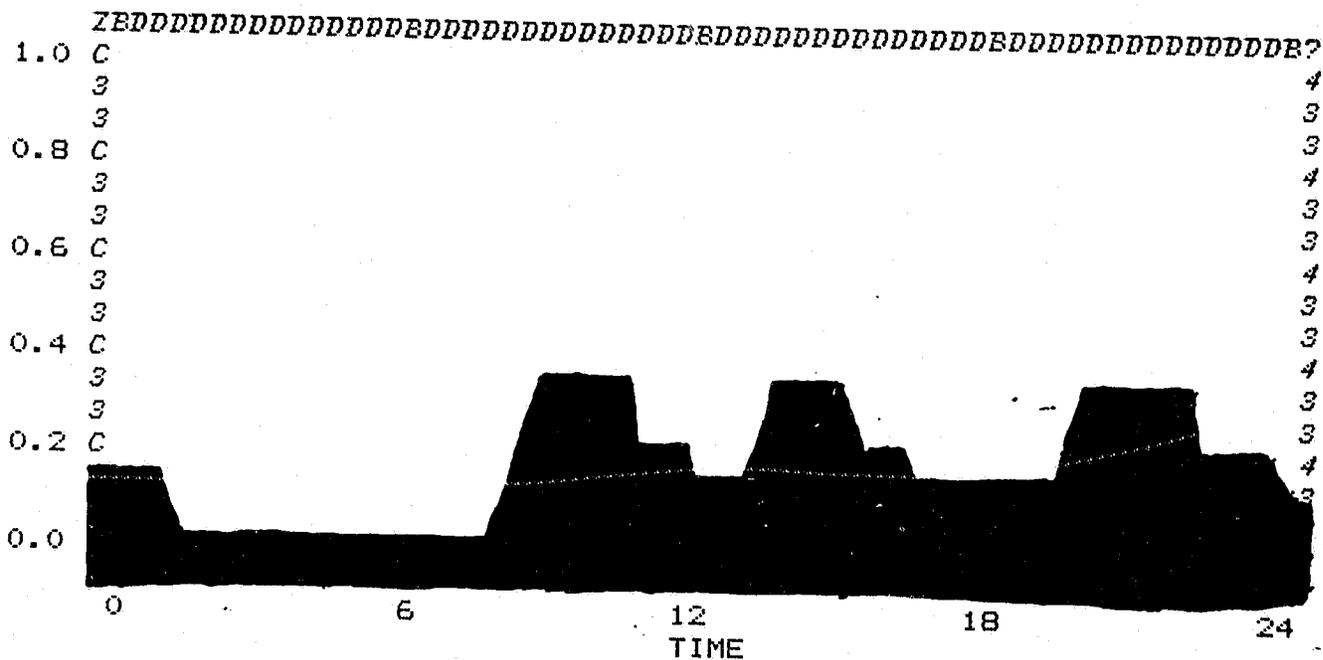
Eight to ten o'clock in the evening is not the usual time for burglaries. Part of the explanation for this unusual time pattern is that our group of burglars is dominated by inner city burglars who burglarize in neighborhoods that have a high unemployment rate. Therefore, houses are not as likely to 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.

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. I just tell them to come on in."

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 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 1: 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 for 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 2 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.

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

TABLE 2: Life Paths of Burglars

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


1965



1960

        + = Unemployed
        x = Quit school or job
```

TABLE 2: 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 2: Life Paths of Burglars (continued)

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

    + = unemployment
    x = quit job or school

TABLE 2: Life Paths of Burglars (continued)

YEAR	BURGLAR P	BURGLAR R	BURGLAR T
1990			
	DRY WALL	TECHNICIAN	AIR FREIGHT
	PLUMBER'S HELPER	KITCHEN WORK	+
	+	MATTRESS FACTORY	+
	x	^	+
	CONSTRUCTION	PRISON	+
1985	JOBS	^	PRISON
	+·	TRUCK DRIVER	+
	+	+	+
	x	+	K-MART
	^	ELECT. HELP.	PRISON
	^	+	+
1980	^	TRASH TRUCKx	+
	^	x	x
	^	^	^
	^	^	^
	^	^	^
	^	^	^
1975	^	^	^
	^	^	^
	^	^	^
	SCHOOL	^	^
		^	SCHOOL
		SCHOOL	
1970			
1965			
1960			
1955			

+ = unemployment
x = quit job or school

TABLE 2: Life Paths of Burglars (continued)

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

+ = unemployed
x = quit school or job

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 <u>not</u> 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.

FIGURE 29

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

Time

1990

1985

1980

1975

1970

1965

1960

Work

Prison

Prison

Work

Work

Active
Crime

School

School

School

School

Home

4   3   2   1   0   1   2   3   4

Distance (miles)
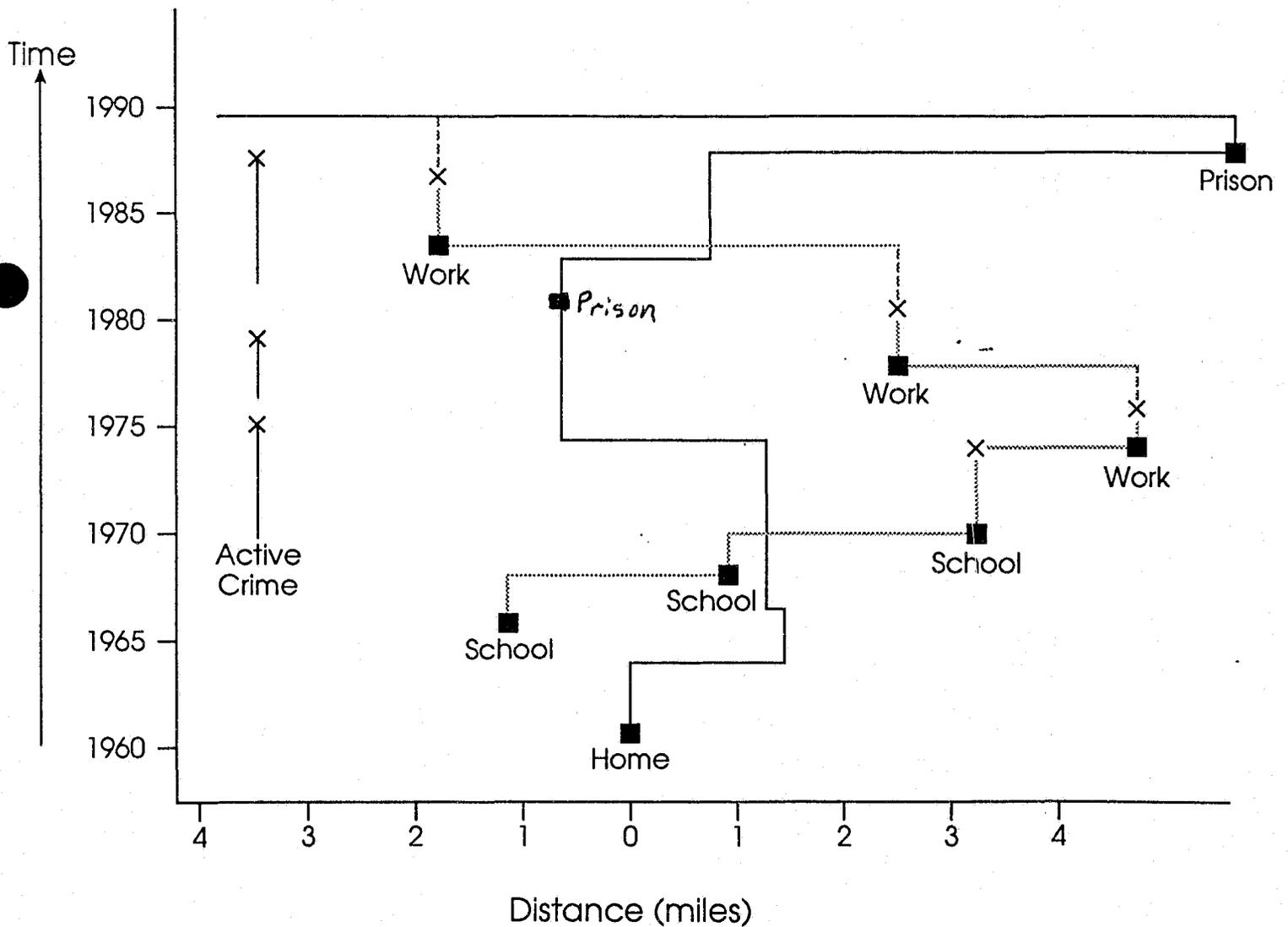
X = Quit or fired

⋮ = Unemployed

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.

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. 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.

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 mater 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 several years 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.

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. The discipline of prison life is for some individuals the necessary first step towards learning a new life-path, and establishing new patterns of time use.

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.

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