

✓ CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN
THEORY COMPENDIUM

March 1978

This project was supported by Contract No. J-LEAA-022-74 awarded by the Law Enforcement Assistance Administration, U.S. Department of Justice, under the Omnibus Crime Control and Safe Streets Act of 1968, as amended. Points of view or opinions stated in this document are those of the author(s) and do not necessarily represent the official position or policies of the U.S. Department of Justice.

Westinghouse Electric Corporation
Arlington, Virginia 22202

NCJRS

SEP 11 1978

ACQUISITIONS

50382



PREFACE

This multidisciplinary draft volume is comprised of 14 papers that advance aspects of the theoretical foundation of the Crime Prevention Through Environmental Design (CPTED) Program. Each paper was prepared by one or more specialists outside of the Westinghouse consortium. The authors focused on problem areas that are close to their own interests and experiences, and have implications for the CPTED approach. These papers are being edited for publication in a compendium to be generated by the Law Enforcement Assistance Administration.

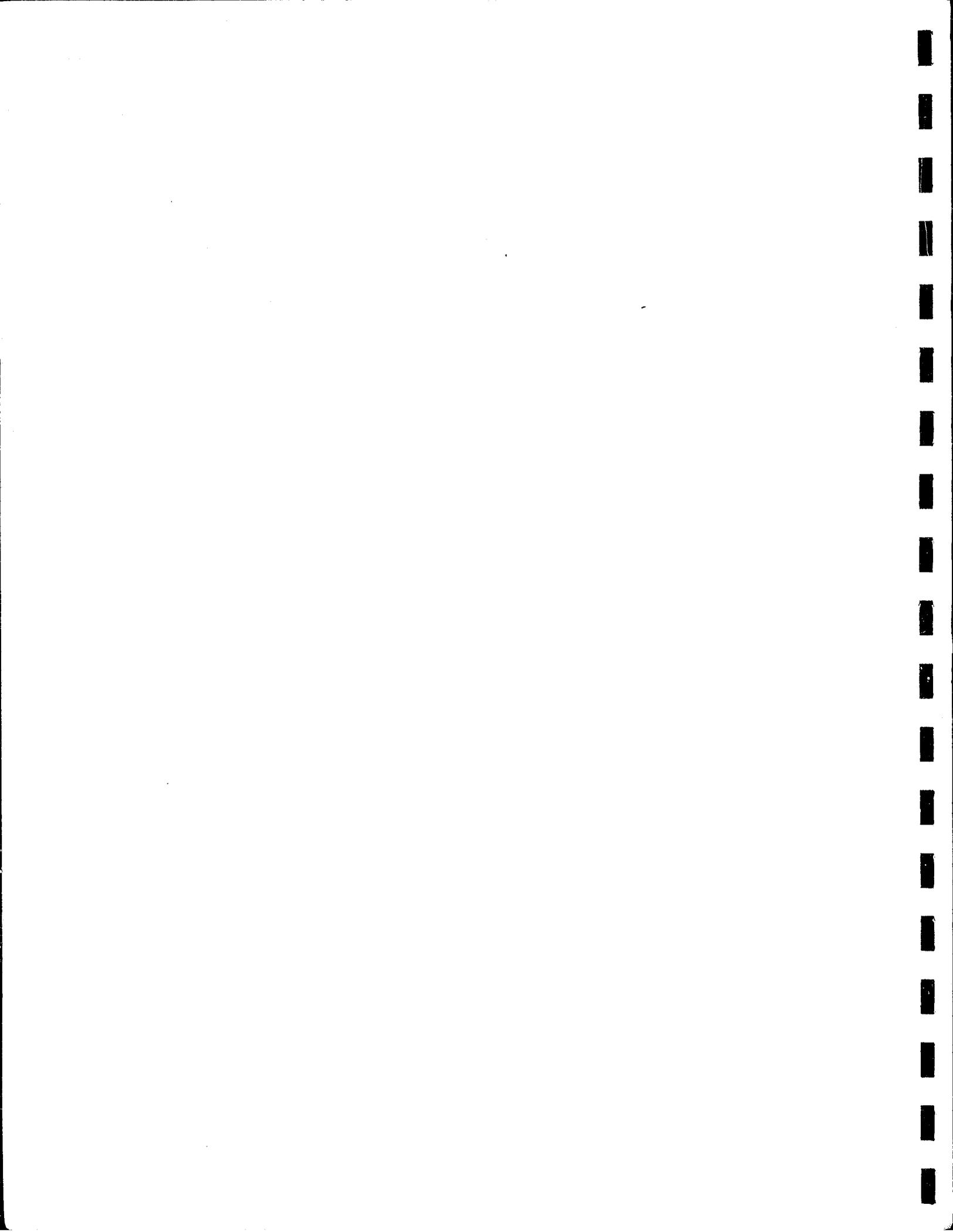


TABLE OF CONTENTS

Preface

Authors and Titles

- Robert Bechtel (Department of Psychology, University of Arizona), "Undermanning Theory and Crime."
- Donald Black and M. P. Baumgartner (Department of Sociology, Yale University), "Self-Help in Modern Society."
- Barbara B. Brown and Irwin Altman (Department of Psychology, University of Utah), "Territoriality and Residential Crime: A Conceptual Framework."
- John E. Conklin (Department of Sociology, Tufts University), "Crime Prevention Through Environmental Design in the Urban Shopping District."
- Frances Goldberg and William Michelson (Department of Sociology, University of Toronto), "Defensible Space as a Factor in Combatting Fear Among the Elderly: Evidence from Sherbourne Lanes."
- William Ittelson (Department of Psychology, University of Arizona), "Crime Prevention in the Context of Environmental Psychology."
- Frank Landy (Department of Psychology, Pennsylvania State University), "Motivation Models Applied to CPTED Issues."
- Authur Patterson (Division of Man-Environment Relations, Pennsylvania State University), "Crime and Fear of Crime Among the Elderly: The Role of the Physical and Social Environment."
- Albert Reiss, Jr. (Department of Sociology, Yale University), "Environmental Determinants of Victimization by Crime and Its Control: Offenders and Victims."

- Thomas Reppetto (John Jay College of Criminal Justice), "Crime by Design: Some Observations from the Past."
- Anne Schneider and Peter Schneider (Political Science Department, University of Oregon), "Private and Public-Minded Citizen Responses to a Neighborhood-Based Crime Prevention Strategy."
- Robert Sommer (Department of Psychology, University of California), "Developing Proprietary Attitudes Toward the Public Environment."
- George Sternlieb, Robert W. Burchell, and Stephen Casey (Center for Urban Policy Research, Rutgers University), "Municipal Crime Rates and Land Use Patterns."
- Raymond G. Studer (Division of Man-Environment Relations, Pennsylvania State University), "Behavior Technology and the Modification of Criminal Behavior Through Environmental Design and Management."

UNDERMANNING THEORY AND CRIME

Robert B. Bechtel

Environmental Research and Development Foundation

and

University of Arizona

Background

In order to discuss how undermanning theory and the concepts derived from ecological psychology can address the requirements of CPTED it is first necessary to describe in some detail the evolution of ecological psychology as a discipline.

Although there exists a thirty-year history of research in ecological psychology, the topic remains unfamiliar to most researchers in psychology and sociology. The ecological psychology movement began with the founding of the Midwest Psychological Field Station by Roger Barker and Herbert Wright in 1947. The original intention was to study how children were raised in the total community. The first volume from the project, One Boy's Day (Barker and Wright 1951), dealt with one day's behavior of one child. Subsequently, however, it was discovered that the community divided itself into natural units of behavior called behavior settings. Behavior settings are the key to understanding the approach of Ecological Psychology to the study of human behavior.

Every community sorts itself into behavior settings in order to get the business of daily life accomplished. Behavior settings are the grocery stores, lawyer's offices, classrooms and meetings of everyday life. When all the behavior settings in a community are accounted for, 95 percent of the waking behavior is included (allowing, more or less, five percent error of measurement). It is not possible to behave outside of a behavior setting.

Behavior settings have certain physical and behavioral dimensions that are always present. There is a standing pattern of behavior that is repeated continuously and tied to a particular time and place. Anyone can go to the place where a setting occurs and watch the behavior pattern being repeated at its specified times. Grocery stores are open at a certain time, closed at others. During working hours the behavior characteristics of grocery stores are repeated.

Although behavior settings are easily recognized by residents of a community in their daily activities, Barker developed a seven-dimensional scale to identify whether two putative settings were separate or one. The scale quantifies the kinds of overlap that can occur between settings. There can be overlap in population, leadership, the kinds of physical objects used, the spatial areas occupied, the kinds of interpersonal

behavior, the kinds of personal behavior (which Barker calls behavior mechanisms) and the times at which behavior occurs. The scale is called the K-21 scale to indicate that when there is less than 50 percent overlap in each of these dimensions, the total score will be 21 or more. When overlap occurs, on an average, more than 50 percent on all seven dimensions, the score will be less than 21. Behavior settings are operationally defined, then, as settings which score 21 or over on the K-21 scale as compared to every other potential setting in the community or organization. However, there are empirical indications that when K-21 scores range from 17-23 between two settings there are boundary problems. These boundary problems are settled by occupants of the two settings in one of two ways. Either they erect physical barriers such as walls or screens, or they adopt psychological barriers of behavior such as learning not to appear to listen to each other or not to work too near one another. The psychological barriers, however, require an energy output which detracts from the other behavior in the setting.

Behavior settings are more or less discrete entities into which the people of a community sort themselves out to get the daily business of living done. Usually these settings are defined by physical boundaries

such as walls. There are, therefore, implications in design for defining, enhancing and limiting settings.

The behavior setting survey is not a survey of people but of behavior settings. Conducting a behavior setting survey means cataloging all of the behavior settings in a community that occur over the period of a year. Originally (Barker and Wright 1955; Barker 1968) behavior setting surveys required one year to collect the data by use of observers and informants. Recently, however (Bechtel 1977), that time has been cut to two to four weeks using retrospective interviews. In addition, behavior setting surveys can be conducted in recognized organizations such as churches, schools, industrial plants or offices.

The behavior setting is the context for human behavior in Barker's Undermanning Theory. Yet behavior settings do not exist as isolated entities but are always part of a community or organization. It was as a result of studying community size effects that undermanning theory was discovered. The theory was first proposed by Barker (1960) in the Nebraska Symposium on Motivation. In this first paper on undermanning, Barker describes how he discovered the principles by comparing the behavior setting surveys of two towns. One town was the location of the Midwest Psychological Field Station. The second

town was a community in England, selected for its similarity to the first town. By comparing the two behavior setting surveys, Barker noticed some wide discrepancies in what should have been very similar data. For example, although the English town had a population two times larger than the American town, the American town had 20 percent more behavior settings. Citizens of the American town also had 70 percent more responsible positions in behavior settings compared to citizens in the English town. Barker saw these differences as a direct function of size of community. The smaller a community, the greater the tendency to become undermanned. Undermanning seemed to be a condition where there are too few people available for behavior setting requirements.

Barker also posited that there were 11 significant consequences of undermanned behavior settings:

- A. There is a greater claim that a smaller setting makes on each person; therefore,
 - 1. He has to work harder, and
 - 2. He has to do greater and more important work.
- B. In a smaller setting, because there are fewer numbers, there are more and wider forces acting on each person to produce; therefore,
 - 3. Each person has a wider variety of activities,
 - 4. Has less sensitivity to and less need to evaluate differences between people, and

5. Has a lower level of maximum performance.
- C. Because the wider range of forces act together, their joint influence will produce:
 6. Greater importance for each person in the setting,
 7. More responsibility for each person in the setting,
 8. Greater self-identity for each person in the setting,
 9. Lower standards and fewer tests for admission to the setting,
 10. Greater insecurity, and
 11. More frequent occurrences of success or failure.

Following the symposium article, Barker and Gump (1964) began a systematic course of investigation in schools to test out the predicted effects of undermanning. A series of large and small schools were chosen for comparison. It was hypothesized that the small schools would experience undermanning and its consequent effects. Largely, these expectations were realized. The smaller schools had fewer people per setting and the members of these settings reported the kinds of effects predicted, greater pressure to participate, greater feelings of being obligated toward the setting, and a greater sense

of responsibility. In a follow-up study, Baird (1969) took a national sample of schools (N = 21,000) and found the undermanning thesis held up. Using archival data, he selected six areas to measure.

He found that on four out of the six measures (leadership, music, drama, speech and writing), the smaller schools did better. This was the first attempt to demonstrate academic performance was better as a result of undermanning. In the Barker and Gump (1964) study, only participation in extra-curricular activities was measured.

Wicker (1968), Wicker and Mehler (1971), found that undermanning principles held for churches. Participation and satisfaction levels were reported greater for small churches as opposed to larger ones. Bahtel (1977) reported undermanning principles also held for large and small military bases.

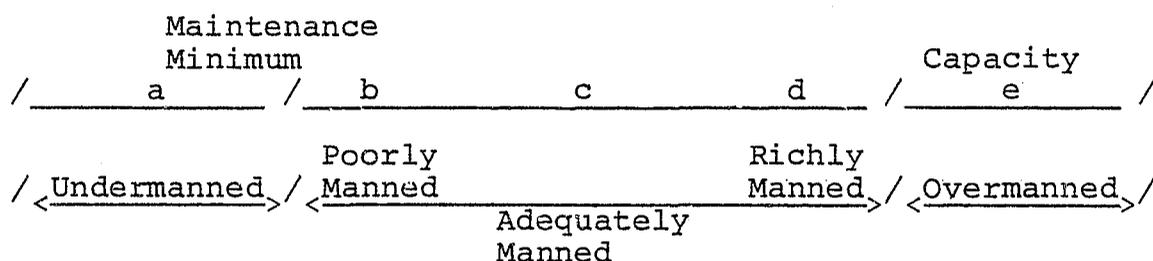
Wicker (1973) has criticized previous undermanning research for concentrating on organization of community size rather than setting size as the determining variable. Underlying all these studies was the assumption that community or organizational size was directly related to behavior setting size and that small communities would have correspondingly smaller behavior settings. Yet this assumption had not been tested on large samples. Wicker

et al. (1972) surveyed a national population of 37,000 churches (populations > 100 to < 3200). Using archival data, he found "a linear relationship between each of three measures of participation (in settings) and size of membership" Gump (1971) reports a linear relationship between size of organization and number of settings in an organization doubles, the population will increase by a factor of eight.

The degree of manning had also not been defined. Wicker (1973) proposed the following definitions for degrees of manning:

Figure 1

The Continuum of Degrees of Manning
(From Wicker 1973, page 191)



maintenance minimum was the minimum number of persons required in order for the setting to be maintained.

capacity was the maximum number of persons which the setting can accommodate.

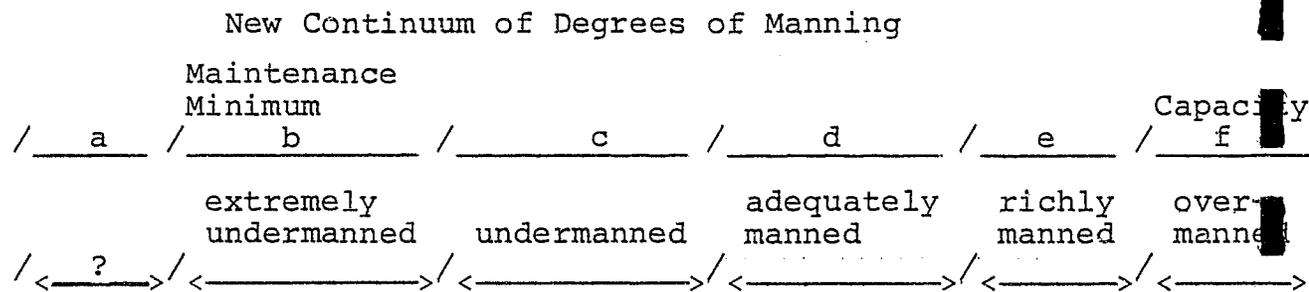
applicants are the total number of persons who both seek to participate and meet the eligibility requirements.

When number of applicants exceeds the capacity of the setting, it is overmanned. When applicants are between the capacity and maintenance minimum level, the setting is adequately manned. When the applicants are below the maintenance minimum, undermanning occurs.

The latter definition for undermanning is unsatisfactory because if maintenance minimum is the minimum number of persons required to maintain the setting, then below that level the setting will not be maintained. Therefore, according to this definition, undermanning would be a condition in which the setting could not maintain itself. Undermanning would seem to be in the area Wicker calls poorly manned while the undermanned area designated in Figure 1 might at first seem to be better termed extremely undermanned according to Srivastava's (1975) findings. Srivastava found that a mental hospital

staff were in such an undermanned situation that they were unable to perform their tasks properly. This group did not experience any benefits from undermanning and were visibly distressed. Yet even this extremely undermanned group was able to minimally maintain their settings. Thus, all types of undermanning should be above the maintenance minimum level. Taking these data into account, Wicker's diagram should be redrawn as follows:

Figure 2



In redrawing the continuum of degrees of manning, poorly manned is replaced by undermanned and extremely undermanned carves out a new place next to maintenance minimum. The space to the left of maintenance minimum is presumably where disintegration takes place and the setting can no longer function.

Thus, by the middle 1970s undermanning theory had been established with a fair number of empirical studies to support it. Bechtel (1977) proposed that the original 11 consequences be reduced to five, according to subsequent evidence:

1. Wider variety of activities. Gump and Freison (1964) and Wicker (1964) show this to be a confirmed consequence of smaller settings but as Petty (1971) says, the research has been done on organizations rather than behavior settings. Also, it must be understood that this refers to participation of persons within a setting. Persons in larger organizations are exposed to a wider variety of behaviors and don't participate in them.
2. Increased level of maximum performance seems to be the finding rather than Barker's No. 5, decreased level. Baird (1969) showed higher performance levels for small schools. Job enrichment literature (Walton 1972) shows increased levels in undermanned organizations, and Callender (1970) shows the same for undermanned Air Force installations. Gump and Friesen (1964) report inhabitants of smaller settings engaging in more difficult and more important tasks. This is

confirmed by Wicker (1968, 1964), Wicker et al. (1972), Petty (1971) and Willems (1965).

3. Greater feelings of importance and increased sense of self-identity through increased feelings of competence. Barker's original prediction of insecurity (No. 10) was not supported by research. Job enrichment data (O'Toole et al. 1973) show greater feelings of security. Greater feelings of importance are shown from the school studies (Gump and Friesen 1964; Willems 1965; Wicker 1963) and by the church studies (Wicker 1964).
4. Higher participation level accompanied by more responsibility and greater felt needs to participate. Greater responsibility and participation is a finding of most studies (Gump and Friesen 1964; Willems 1964; Wicker 1968; Petty 1971).
5. Greater tendency to accept new and less qualified members into the group. While verbal statements of lower standards and fewer tests for admission was not supported by Perry (1971) or Hanson and Wicker (1973), Wicker and Mehler (1971) showed new members more easily accepted in smaller churches and Petty (1971) showed that while there were no verbally stated differences in admission requirements, the undermanned groups

tended to actually accept less qualified members when choices were made.

The Responsibility Factor

In his study of high schools, Wicker (1968) found that there were students who experienced the 11 benefits described by Barker, but who were members of large schools and large settings. The reason for this positive experience was attributable to the position of responsibility in the large setting. In other words, even in large settings and large organizations, it was possible to experience these effects even though not in an undermanned setting. The benefits derived from a responsible position.

Positions of responsibility in settings were measured by the penetration scale. The scale divides members of settings into six levels of responsibility: (1) the onlooker who does not interact with other members of the setting but is physically present; (2) the visitor, who is present and interacting with other members but is not a member himself; (3) the member, who has credentials of membership, voting rights and responsibilities; (4) the functionary, who serves in some official capacity such as a secretary, sergeant at arms, or treasurer; (5) the shared leadership role, who serve as presidents or vice-presidents and are the functional leaders of the setting;

and (6) the single leader without whom the setting cannot function.

Onlookers are much like the "sidewalk superintendents" at a construction project, while they are present, they contribute little to the setting function and their presence or absence does not affect the setting in any way. Visitors may have some effect and their presence may have an influence on members' behavior, but they are not bona fide members of the setting and have no voting rights. Barker (1968) also calls this level of responsibility the audience. There is some question as to whether members of an audience have the same level of rights as members of an organization.

In any case, there is no question that members are the basic level of participation in a setting or organization. Functionaries are leaders of a sort, but they are not the pivotal leaders in a setting. They nominally cannot take over a setting if one of the leaders is not present or they would be labelled at the fifth level. The fifth level is what the ordinary person would easily recognize as the leader of a setting. He is the chairman, or president, or elected leader, whatever title. Yet, in common practice, this level of leadership is almost always shared. If the chairman doesn't show up, the vice chairman can take over. If this were not the case, as in

level six, the setting would cease to function. Level six is the single leader without whom the setting cannot exist. These people operate one man stores or radio stations. When they are absent, the setting does not function. There are usually very few six level settings to be found, but when they are found, there are more of them in small communities and small organizations than in large ones.

It is common practice to label people at the 4-5-6 level as leaders and to call people at the 1-2-3 levels non-leaders. This is an important distinction because the ratio of leaders to non-leaders increases as the size of organizations and settings increases. In other words, the larger an organization or setting, the fewer chances one has of becoming a leader (i.e., having a responsible position).

If Wicker's (1968) study bears out for all organizations, then one of the reasons why small organizations fare so much better for their members than large organizations, is that the responsibility levels of smaller organizations are more evenly shared among members than in large organizations. And it seems that the experience of responsibility is a necessary part of the positive benefits of undermanning.

The Size Factor

Most researchers of undermanning theory take measurements of organizations or communities that differ in size. The theory assumes that as the size of an organization or community increases, so will the relative size of each setting. Of course, if number of settings increased correspondingly with size of organization, then the size of each setting could, theoretically, remain the same. It seems, however, that as size of organization or community increases, the number of settings does not increase proportionately. This means, of course, that the population has to be "poured" into the settings in ever larger numbers as the size increases.

Size and responsibility seem to be inversely related so that as size increases average level of responsibility decreases disproportionately. This disproportionate decrease is due to a failure of setting numbers to increase with size. Thus, it is theoretically possible to have an organization of great size that would still be undermanned provided the number of settings was deliberately manipulated. There is every indication this would be an artificial manipulation since it seems "natural" growth of an organization would tend to follow disproportionately fewer settings.

Extreme Undermanning

It is true even to the present that the limits of undermanning have not been explored fully. For example, when does undermanning become dysfunctional by having too few people to perform the functions of a setting? While the answer to this question is not known for all settings, the fact that it can be dysfunctional was demonstrated by Srivastava (1975). In the case of a mental hospital staff, Srivastava discovered that the tasks to be performed were so many and so pressing that staff people were near the point of breaking down mentally. Meantime, in the same setting, the patients were not at all undermanned, but had seemingly little to do. In short, the staff were experiencing extreme undermanning which was a crippling situation. There definitely are lower limits to undermanning in all situations.

Overmanning

Wicker (1973) coined the term overmanning to describe what most refer to as crowding. In an overmanned situation there are too many people for what the setting requires so that there is a surplus of manpower. Two facets of overmanning must be considered. One is the actual supply of manpower and the other is the physical capacity of the setting. Obviously, the manpower supply

will seem to be surplus if the setting has a small physical capacity to hold people. And, just as obviously, it will take longer for a surplus to become evident if there is a large physical capacity. Wicker (1971) illustrates this for large and small churches where small ones are quickly forced into holding two services on Sunday, but larger churches with the same number of congregation seem sparsely attended.

A further distinction must be made between overmanning of leaders versus overmanning of non-leaders. Some settings actually strive for full capacity of non-leaders. For example, movie houses, sports stadiums, restaurants. The point at which overmanning occurs is much nearer to the physical capacity of the setting. The non-leaders experiencing the effects of overmanning would be those who either could not get into the setting or who were hampered in some aspect of behavior by the surplus numbers of people in the setting.

Overmanning of leaders (4-5-6 penetration levels) is less related to a capacity concept. Here, whether there is overmanning depends more often on the rules of the setting even though capacity is sometimes involved. Only a certain number of men can play on a football or basketball team or can work in given settings. Setting rules prescribe a limited number of leaders so that

overmanning in this sense becomes a presence of more persons than the rules call for.

For the above reasons, overmanning is never just a matter of density. By these definitions, density is a capacity concept in which only physical space available and numbers of people are involved. This can never be the case for overmanning since the rules of the behavior setting always determine the numbers of people that belong in the leader and non-leader positions and these may or may not be influenced by capacity.

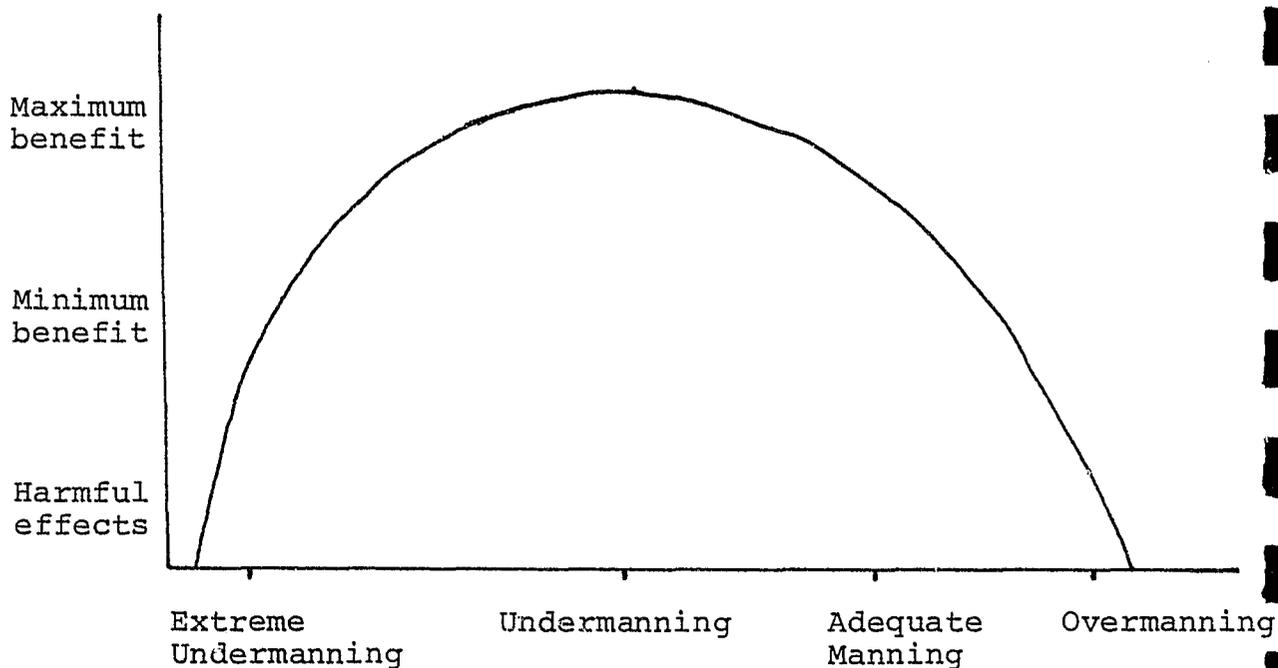
Overmanned settings are not just passive in their effects on members. They seem to exert pressures not to participate. Large schools, and settings, have more dropouts and absences. The "benefits" of overmanning are the opposites of those of undermanning, i.e., less variety of activities participated in, decreased level of performance, etc. People have to compete for positions of responsibility or even membership. Hence many are discouraged from trying. There is less time for participation per pupil in large classes than in smaller ones.

It would seem then, that extreme undermanning and overmanning are at the opposite ends of a hypothetical inverted u-shaped function (see Figure 3). Both ends are debilitating while in the middle of the upward part of the curve is the area of maximal effects of undermanning.

What is especially significant about the curve is that the adequate operational level of settings, i.e., the level that most of us experience, does not have the positive benefits* of undermanning. The consequences of this suggestion are enormous.

Figure 3

Hypothetical Effects of Manning Levels



* Positive benefits means (1) participation in a wider variety of activities, (2) increased level of maximum performance, (3) greater feelings of importance and self-esteem, (4) higher participation level, and (5) greater tendency to accept new and less qualified members of the group.

At the very least, Barker's theory with all its consequences suggests a structure of society that permits a maximum distribution of responsibility levels for all members. The society, as it currently exists, gets at best the minimal benefits of undermanning.

Focal Points

The undermanned environments of small towns seem to provide more opportunities for children and adults to encounter the same people every day than do large towns or cities.

Herbert Wright (1969) studied several effects on children of being raised in small versus large towns. He selected several small towns (population around 500-1,400) and compared these with large towns (population circa 3,000-20,000). Children in each location were asked to identify neighbors on either side of their homes and to tell something about them. In addition the children were invited into a room provided by the researcher and asked to build their town with a set of blocks which would represent the buildings. Table I presents the results of these two measurements.

Children in small towns were able to identify 1.5 times as many elements about their town as children in large towns. This is in contrast to the fact that

TABLE I

Comparison of Knowledge about Environment of
Children Paised in Large and Small Towns
(From Wright 1969)

Variables	Large Community	Small Community
Populations	3,000-20,000	500-1,400
Number of places children get to	53	35
Number of elements presented by children about their town	132	201
Number of elements beyond neighborhoods known by children	112	160
Percentage of children on streets without parents (autonomy)	58	87
Percentage of children in non- leader activities (penetration level 1-2)	31	21.5
Number of neighborhood adult jobs known	7-1/2	20

children in large towns actually reach 1.5 times more places, i.e., there seems to be more variety in the larger town. Also, small town children can identify 2.7 times as many neighborhood adult jobs as large town children.

Wright feels that there is one overriding reason for these differences. It is that people in small towns have a much greater chance to see the same people and places on a day-to-day basis and hence get to know them better.

This finding is reinforced by Milgram (1970) who suggests the concept of sensory overload to explain the experience of living in cities where the number of different contacts is so great that residents have to try to ignore most contacts.

But this phenomenon of increased contacts is not just related to size of the community, it is also related to the design or plan of the community. While it is clear that people in smaller communities will encounter the same people more often than people in larger communities, just on probability alone, it is also clear that the way a community is physically planned for traffic and location of settings can increase or decrease those probabilities of encounter.

The study of small communities carried on by Butler uncovered the "central most" behavior setting of the town. This was a setting that was invariably located at the juncture of the main streets and was usually located in a drugstore or other place of public business. Over the annual life of the community this was the

behavior setting to which the greatest variety of age, sex, social class and racial groups had access. In other words, virtually no one was barred from entry. It was also the behavior setting where people could drop in just to find out "what was going on" in the community. Bechtel (1977) renamed this behavior setting the behavioral focal point because it seemed to increase the amount and variety of behavior in behavior settings around it. It was discovered that military bases which lacked such a focal point suffered from a lack of what sociologists call the informal business of a community. In military bases with a focal point the commander would often meet subordinates informally and suggest work be done. This did not require the formal apparatus of the military. Bases without focal points did work more through formal and paperwork channels.

Furthermore, businesses and recreation such as officers' clubs, snack bars, and libraries had more patrons when they were located juxtaposed to focal points as contrasted to military bases where such locations were not used.

Therefore, it would seem that deliberately locating public places near a planned focal point would help considerably the sense of community and the number of human contacts as well as the business success and use of community spaces.

It was also discovered that focal points were an integral part of small communities while larger communities had many areas without focal points. On the other hand, some neighborhoods within cities evolve their own focal points while others do not. The focal point seems to be a specific design feature that can help to maximize and add to the undermanning effects in a small community or organization by increasing the amount of human contacts and the viability of public settings. Bechtel's (1977) data show settings around focal points are usually richer in varieties of behavior and numbers of different kinds of people.

The Application of Undermanning
Principles to CPTED

According to Kohn et al. (1977) a key planning objective of CPTED, " . . . is to create an environment in which it is apparent that anyone who commits a crime is likely to be detected, apprehended and punished." If any lesson is to be learned from the small community studies of Barker and undermanning theory, it would be to create an environment in which there are no strangers. This would, of course, not entirely eliminate crime but it would make every criminal known and go very far towards reducing the amount of crime. In the small communities where strangers stand out with suspicion and citizens

experience a high level of solidarity, crime is much lower.

Such a fanciful notion is, of course, not practical because the populated areas where crime occurs more frequently are not capable of being manipulated in such a fashion. Kohn et al. (1977) state there are four general theoretical postulates underlying the rationale for crime prevention strategies: access control, surveillance, activity support and motivation reinforcement. Access control refers to site hardening and is not relevant to undermanning theory, but the other three aspects of crime prevention are closely tied to design consequences of undermanning.

1. Surveillance. The main assumption of surveillance is that if criminals know they are being watched they will be deterred from committing crimes. Undermanning and the design aspects of the behavioral focal points serve to provide a natural surveillance process. At first, this may seem similar to Newman's (1972) defensible space concept but the defensible space concept refers to a semi-territorial placement of public spaces such that people will feel responsible for areas under their control. Undermanning is a more social concept in which the surveillance is

directed at strangers. In the smaller, undermanned settings the stranger is deprived of his anonymity, he is confronted, talked to and brought into the circle of the community much more quickly. Thus, there is literally no time for hiding behind anonymity and the stranger's face and features will immediately become known to several people. The stranger attracts notice and is immediately approached. This is all done politely, but there are also rather pertinent questions as to his motives for being present.

2. Activity support is directly fostered by behavioral focal points. In an undermanned situation all resources are more likely to be utilized. The behavioral focal point helps to further insure the sustaining of activities by having related settings complement one another. Typically, if several complementary settings are placed together they will attract more clientele than if each was placed separately. What happens is that people see friends and neighbors going and coming from the public facilities, stop and chat, maybe even have a cup of coffee. If the behavioral focal point provides amenities for sitting and having food or coffee, the process is so much

more enhanced. The increase in activity level is a large deterrent to crime.

3. Motivation reinforcement. The motives that arise from undermanned situations give potential victims a confidence and sense of security in their environment. Small towns have been shown to be higher on cooperative behavior than their city counterparts (Hensson and Slade 1977).

Probably more important than considering each of these elements separately is a consideration that all three operate together in an undermanned environment. The situation is further enhanced by designing in an appropriate focal point. These concepts apply equally well to an urban neighborhood (cf., Project Arrowhead, Dumouchel 1971), military organizations (Bechtel and Ledbetter 1976), housing (Bechtel 1972) and schools (Barker and Gump 1964).

In order for the effects of undermanning to be realized, units of about 250 people should be considered as optimal. This figure is arrived at from work in Iran where 60 percent of the population lives in villages of 250 or less; from the Arrowhead Project in Cleveland where it was discovered that friendship associations seemed to occur in clusters of 250 people, and from the

school studies (Kansas City) where 250 pupils seemed to make a good dividing point between large and small schools (producing statistically significant differences in standard test scores), and from the military studies where 250 seemed to be a cutting off point to divide small from large installations.

For many reasons, such a small number may not be practical, but it might still be possible to cluster units of 250 or less so that amenities could be designed for the clusters.

But to limit the applications of undermanning to the three CPTED principles would be a disservice. There are wider applications for prevention in schools, prisons and the way police departments are run.

For example, one clear result of the school studies is that the smaller schools require a much higher participation level for average and below average students. If one agrees with current opinion that most delinquency is school related (Ahlstrom and Havighurst 1971) then the deliberate undermanning of schools might contribute a great deal to primary prevention of delinquency.

Prisons are a situation where prisoners are placed into an overmanned condition with little responsibility. A deliberate restructuring where the level of responsibility is increased might help alleviate much

of the debilitating effects of prison. This would be no small task considering the security problems and the political obstacles to be overcome.

Police departments are another area where undermanning principles could be applied by increasing the responsibility of front line officers. While many feel the police departments are already extremely undermanned, it may be that many front line officers are so hampered by restrictions and lack of authority that a job enrichment program might be of considerable benefit.

Conclusion

This paper has reviewed the concepts and research done with undermanning theory during the last 30 years. Undermanning theory directly relates to the three CPTED principles of surveillance, activity support and motivation reinforcement. In undermanned environments, surveillance activity levels and motivation reinforcement of participants is increased in a positive fashion that would not only help prevent crime but have other positive community benefits as well. This is especially true if behavioral focal points are designed into the environment.

But undermanning has a potential use also as a primary and secondary prevention device in schools, prisons and police departments.

REFERENCES

- Ahlstrom, W. and Havighurst, R. 400 Losers. Jossey-Bass, 1971.
- Baird, L. Big School, Small School: A Critical Examination of the Hypothesis. Journal of Educational Psychology, Vol. 60 (1969), pp. 253-260.
- Barker, R. Ecology and Motivation. In M. Jones (ed.) Nebraska Symposium on Motivation, University of Nebraska Press, 1960, pp. 1-49.
- Barker, R. Ecological Psychology. Stanford University Press, 1968.
- Barker, R. and Gump, P. Big School, Small School. Stanford University Press, 1964.
- Barker, R. and Wright, H. One Boy's Day. Harper and Row, 1951.
- Barker, R. and Wright, H. Midwest and Its Children. Row Peterson, 1955.
- Bechtel, R. The Juvenile Delinquency Intercept Project of the Greater Kansas City Mental Health Foundation. Greater Kansas City Mental Health Foundation, 1972.
- Bechtel, R. Enclosing Behavior. Dowden, Hutchinson and Ross, 1977.
- Bechtel, R. and Ledbetter, C. B. The Temporary Environment. Cold Regions Research and Engineering Laboratory, 1976.
- Dumouchel, R. Arrowhead Final Recommendations. Environmental Research and Development Foundation, 1971.
- Gump, P. Linkages between the Ecological Environment and the Behavior and Experience of Persons. Paper presented at the Conference on Ecology of Human Living Environments, University of Wisconsin, Green Bay, 1971.

- Gump, P. and Friesen, W. Participation in Nonclass Settings. In R. Barker and P. Gump (eds.) Big School, Small School. Stanford University Press, 1964, pp. 175-193.
- Hanson, L. and Wicker, A. Effects of Overmanning on Group Experience and Task Performance. Paper presented at the Western Psychological Association Convention, Anaheim, California, 1973.
- Hansson, R. and Slade, K. Altruism Toward a Deviant in City and Small Town. Journal of Applied Social Psychology, Vol. 7 (1977), pp. 272-279.
- Kohn, I., Locasso, R., Bell, L., Miaor, W. and Dubnikor, A. Crime Prevention Through Environmental Design Theory and Framework. Paper presented at APA Symposium on Crime Prevention Through Environmental Design, San Francisco, California, September 1977.
- Milgram, S. The Experience of Living in Cities. Science, Vol. 167 (1970), pp. 1461-1468.
- Newman, O. Defensible Space. Macmillan, 1971.
- O'Toole, J., Hansot, E., Herman, W., Herrick, N., Liebow, E., Lusignan, B., Richman, H., Sheppard, H., Sefhansky, B. and Wright, J. Work in America. MIT Press, 1973.
- Petty, R. The Assimilation of a New Group Member: A Laboratory Study of Behavior Setting Theory. Master's Thesis, University of Illinois, 1971.
- Srivastava, R. Undermanning Theory in the Context of Mental Health Care Environments. In D. Carson (ed.) Man-Environment Interactions, Part II. Dowden, Hutchinson and Ross, 1975, pp. 245-258.
- Walton, R. Workplace Alienation and the Need for Major Innovation. Unpublished manuscript, May 1972.
- Wicker, A. Undermanning, Performances and Students' Subjective Experiences in Behavior Settings of Large and Small High Schools. Journal of Personality and Social Psychology, Vol. 10 (1968), pp. 255-261.

- Wicker, A. Undermanning Theory and Research: Implications for the Study of Psychological and Behavioral Effects of Excess Populations. Representative Research in Social Psychology, Vol. 4, 1973.
- Wicker, A. Size of Church Membership and Members' Support of Church Behavior Settings. Journal of Personality and Social Psychology, Vol. 13 (1964), pp. 278-288.
- Wicker, A. and Mehler, A. Assimilation of New Members in a Large and a Small Church. Journal of Applied Psychology, Vol. 55 (1971), pp. 151-156.
- Wicker, A., McGrath, J. and Armstrong, G. Organization Size and Behavioral Setting Capacity as Determinants of Member Participation. Behavioral Science, Vol. 17 (1972), pp. 499-513.
- Willems, E. Forces Toward Participation in Behavior Settings. In R. Barker and P. Gump (eds.) Big School, Small School. Stanford University Press, 1964, pp. 115-135.
- Willems, E. Participation in Behavior Settings in Relation to Three Variables: Size of Behavior Settings, Marginality of Persons and Sensitivity to Audiences. Ph.D. Dissertation, University of Kansas, 1965.
- Zimbardo, P. The Human Choice: Individuation, Reason and Order versus Deindividuation, Impulse and Chaos. In W. Arnold and D. Levine (eds.) Nebraska Symposium on Motivation, University of Nebraska Press, 1969.



SELF-HELP IN MODERN SOCIETY*

Donald Black

and

M. P. Baumgartner

Yale University

March, 1978

*This paper was prepared under contract for the Crime Prevention through Environmental Design Program of the National Issues Center, Westinghouse Electric Corporation, Arlington, Virginia. The Program is supported by a grant from the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, United States Department of Justice. For commenting upon an earlier draft, we thank W. Dale Dannefer, Edward deGrazia, Stephen A. Duennebier, Imre R. Kohn, F. P. Romo, and Stanton Wheeler.



In a modern society, much conflict between people is defined as crime and is handled by officials of the state such as police, prosecutors, and judges. It is taken for granted that ordinary citizens are unable to solve many of their problems with others, but must turn to law for help.¹ This mode of social control has several distinctive consequences: It dramatizes the deviant character of an offense, for example (see Tannenbaum, 1938:19-21), and it may escalate hostility between the parties involved (see, e.g., Gibbs, 1963). Its patterns of detection and other procedures also affect the nature and distribution of crime itself, making some kinds of conduct in some places more vulnerable to observation and intervention, leaving other kinds in other places relatively immune. Finally, for the offender, law tends to be more stigmatizing and disabling than other social control and so may even render future conformity less likely.² If, however, people were to engage in more self-help rather than relying so heavily upon law, that is, if they were to exercise more social control on their own, a different kind of public order would prevail.³ In the nature of the case, many incidents would effectively be decriminalized, since they would no longer be formally defined and handled as criminal, and beyond this, many patterns of conduct themselves would surely change in response to new risks and opportunities. In this paper, we specify several conditions under which self-help flourishes and suggest a number of techniques by which it might be stimulated.

Self-help is by no means a new phenomenon. Rather, it is a social practice which has been commonplace in many settings, and which is present

to some degree nearly everywhere. It is a quantitative variable, which may be greater in one place and weaker in another. Historically, for instance, the amount of self-help has been highest in the simplest societies, in bands and tribes, and has declined progressively with social evolution and the growth of law (see Hobhouse, 1951:Chapter 3). Within developed societies as well, some groups of people engage in much self-help -- even to the point of organized vigilantism -- while others are more dependent upon legal control.⁴ The same individuals may have recourse to self-help upon some occasions and turn to law upon others.⁵ It might also be noted that, like law, self-help has both preventive and remedial aspects, and these vary quantitatively and to some degree independently across social locations. The problem is to isolate the conditions which predict and explain variation of this kind.

Developments in the theory of law and in the theory of altruism, or helping behavior, provide useful perspectives on this topic. The theory of law is relevant since self-help, like other non-legal social control, generally varies inversely with law (see Black, 1976:107-111), and what predicts the one may therefore predict the other in a pattern of opposition. The theory of altruism is relevant as well, since the exercise of informal social control by one person on behalf of another, including his or her willingness to intervene in a dispute and to attempt mediation, is itself a variety of help. Hence, whatever encourages altruism in general may be important in the production of self-help as a system of social control. Our approach draws upon these theories, and also upon the body of work

known as "crime prevention through environmental design," insofar as that work addresses the phenomenon of social control (see, e.g., Tien, Reppetto, and Hanes, 1976:Chapter 3).

Building on these traditions, we suggest several strategies by which it may be possible to increase the quantity of self-help in modern society. These include an administrative, an architectural, and a technological strategy. The first pertains to the allocation of police, the second to the design of physical space, and the third to the use of electronic and other devices. Each of these allows ready manipulation of variables important to our problem. (For these purposes, we leave aside strategies that would require large-scale reconstruction of society, such as those affecting the distribution of wealth or the ethnic composition of communities, though these may also have implications for self-help.) Our discussion begins with the administrative strategy.

Depolicing

Most people concerned with crime and law enforcement take for granted that more police, with more power, will mean less crime. Increases of this kind are claimed to work preventively against crime through the greater surveillance they entail. They are also asserted to work remedially, by allowing more speedy and certain apprehension of offenders.

While these ideas undoubtedly have some validity, especially in the short term, strengthening the police presence is not a sure means of crime reduction (for a review of evidence, see Wilson, 1974), and it has its own

disadvantages as well. Since the relationship between law and self-help is inverse, it follows that the larger and more intrusive a police force is, the weaker self-help will be, a pattern that could in the long term exacerbate the problem of crime. With the growth of law and the police -- an evolutionary process involving many variables (see Black, 1976) -- the citizenry becomes increasingly dependent upon the state to define and maintain order. People increasingly cease to take responsibility for their own security and dispute settlement, for instance, or to help others with matters of this kind. Waiting for the police to arrive, they may even stand by passively as an assault or other victimization takes place. Each expansion of police and other legal protection thus results in a new and higher level of need for these very services, leading to their ever escalating proliferation. A classic analysis of this pattern was done by Peter Kropotkin at the turn of the century:

The absorption of all social functions by the State necessarily favoured the development of an unbridled, narrow-minded individualism. In proportion as the obligations towards the State grew in numbers the citizens were evidently relieved from their obligations towards each other....In barbarian society, to assist at a fight between two men, arisen from a quarrel, and not to prevent it from taking a fatal issue, meant to be oneself treated as a murderer; but under the theory of the all-protecting State the bystander need not intrude: it is the policeman's business to interfere, or not (1914:227-228).

More recently, Michael Taylor has discussed the same phenomenon:

Positive altruism and voluntary cooperative behavior atrophy in the presence of the state.... Thus,...the state exacerbates the conditions which are supposed to make it necessary. We might say that the state is like an addictive drug: the more of it we have, the more we 'need' it and the more we come to 'depend' on it (1976:134).

It is partly this dependence that explains why an increase in the number and power of police is usually seen as the solution to problems of public order. Cutting back on the police -- or depolicing -- is almost never considered as a way to ameliorate these problems.⁶

If police protection were reduced, however, the volume and intensity of self-help would rise correspondingly, reversing the trend toward ever-greater dependence upon law.⁷ This too follows from the inverse relationship between law and self-help. Everywhere, people would undertake more preventive surveillance on their own, would work out more informal settlements of their disputes with the other parties involved, and would lend assistance to those in need of help more readily.⁸

Experimental evidence already exists to show that people are generally most helpful when the need for their assistance seems most apparent -- that is, when alternatives to their participation are most clearly lacking (see Darley and Latané, 1968; Bickman, 1971). The same pattern operates in social institutions. It has been argued, for example, that in societies where blood donorship is entirely voluntary the need for blood is more likely to be met than in societies where blood is bought and sold so that, in effect, people are hired to perform this service (Titmuss, 1971; compare Arrow,

1972; see also Singer, 1973). In light of this, it would seem that making police conspicuous by their absence would lead citizens to draw upon their own resources and assist one another in solving their problems.

Given the currently high level of reliance upon police, it might be advisable to begin a transition to self-help with small cutbacks and, from there, proceed gradually. Indeed, in a society in which people have become conditioned to depend on the government for public order, a sudden and complete removal of officials could well precipitate a Hobbesian "war of all against all" (Taylor, 1976:141).⁹ There have been, in fact, a number of cases in which a drastic decrease of police service has resulted in widespread rioting, looting, and assault (see, e.g., Andenaes, 1966: 961-962).¹⁰ Nevertheless, extensive disruptions of police service often produce self-help smoothly and quickly. In the wake of disasters such as earthquakes, tornadoes, and floods, for example, routine operations by the police and other authorities frequently break down, while the demand for their services increases sharply. At such times, individuals in the stricken communities typically take command of the situation and willingly lend assistance to one another. Informal social control exercised by the citizens themselves virtually always maintains order; plundering and fighting are rare (for an overview, see Miletic, Drabek, and Haas, 1975: Chapters 4-5).¹¹ Even a sudden breakdown of police control, then, may give rise to self-help without large-scale disorder, and a program of gradual depolicing should encourage this all the more.

Once depolicing has begun, for whatever reason, the self-help that arises feeds upon itself. Just as self-help atrophies when law grows, with law continually creating conditions that make itself necessary, so the reverse is true: Self-help engenders more self-help. The more people come to rely upon themselves for dispute settlement and other social control, the more established does their self-reliance become. The more people help each other in any way, the more their mutual aid flourishes (see Taylor, 1976:136-140). This idea has received considerable support from experiments and other research on the phenomenon of altruism. Perhaps most relevant is evidence that people are more likely to behave altruistically if they are presented with "models" of altruism in the behavior of others (e.g., Bryan and Test, 1967; Hornstein, 1970). For example, in one study it was found that people were more likely to help a motorist with a disabled vehicle if they had recently observed a similar situation (staged for the experiment) in which help was being given by another motorist (Bryan and Test, 1967:401-403). It seems reasonable to infer that people are more likely to provide help to victims of crime or related problems when they are aware of others who engage in similar behavior. There is also evidence that people are more likely to behave altruistically if they themselves -- or persons close to them -- have been recipients of altruism. Thus, for example, many blood donors are people who have been beneficiaries of blood provided by others (Titmuss, 1971:228-229). It seems that the same should apply to beneficiaries of self-help. Moreover, it is likely that if people were more dependent upon self-help they would come to expect this service

from each other and would hold in disrepute those not doing their part. This process, a system of social control in its own right, is known to have occurred in earlier societies that had no law at all (see, e.g., Kropotkin, 1914:131).

In sum, a body of theory and research suggests that depolicing would contribute to the growth of self-help in modern society. Depolicing would in and of itself produce self-help to some degree, and this self-help would in turn produce still more self-help.

Physical Design

The design of physical space provides another means for increasing the quantity of self-help. This is an architectural strategy that draws upon a larger body of work on the relationship between human behavior and the physical environment. In particular, it draws upon the well-known principle that social interaction reflects the physical setting in which it occurs (see, e.g., Sommer, 1969). The setting may, for instance, enlarge or limit the range of conduct that is possible and the number of people to which any individual is likely to relate. It may be "sociopetal," bringing people together and fostering contact among them, or it may be "sociofugal," inhibiting or discouraging such contact (see Osmond, 1957:28).¹² Differences of this kind may have implications for both the preventive and the remedial aspects of self-help, especially as these involve actions on behalf of others.

In recent years, in fact, this approach has received considerable attention from city planners and others concerned with the reduction of crime (see, e.g., Tien et al., 1976:Chapter 2). A number of suggestions have pertained to how physical settings might be designed in order to maximize natural surveillance and, to a much lesser extent, create conditions likely to result in mutual aid among citizens. Proposals for increasing surveillance include the diversification of functions in urban areas, which would help ensure the presence of people in all areas at all times (e.g., Jacobs, 1961:Chapter 8), the concentration of flows of pedestrian traffic (e.g., Angel, 1968), and the design of windows, hallways, doorways, courtyards, and other spaces so as to enhance the visibility of social activity (e.g., Wood, 1961:especially 11-12; Newman, 1972:Chapter 4). Proposals for encouraging mutual assistance -- including a willingness to take advantage of opportunities for surveillance -- have entailed at least implicit recognition that, all else constant, people are most likely to help those with whom they are intimate and least likely to help strangers.¹³ In addition, the degree of intimacy between people is positively related to their willingness to help a third party. For example, it was found in one experiment that two friends were more likely than two strangers to help an apparently injured woman (Latané and Rodin, 1969). Any means by which contact among people can be increased will therefore lead to a growth of helping behavior, and one such means is the creation of sociopetal environments. For instance, neighborhoods and dwelling units readily lend themselves to designs that nurture strong ties and hence mutual aid (see

Jeffery, 1971:219-220), and most work concerned with the relationship between physical design and social control focuses upon settings of this kind. Thus, it has been suggested that city streets and housing complexes can occasion social cohesion if their design makes people accessible to one another through proximity and natural exposure, while simultaneously setting them apart from the rest of an urban center by real or symbolic barriers (see, e.g., Tien et al., 1976:78; see also Newman, 1972). It has also been suggested, in another context, that individual dwellings themselves might contribute to social cohesion if they were to contain interior spaces, visible from the street, where inhabitants could make themselves available for casual visits (Alexander, 1967:87-88, 94-96). Yet another architectural means by which personal relationships might be cultivated would involve the construction of parks, playgrounds, lobbies, laundries, and other communal areas that are attractive to people and sociopetal in design (Wood, 1961: 12-17; see also Alexander, 1967:88, 96-97).

Beyond the possibilities for self-help inherent in personal relationships of a durable nature, there are others that derive from situational interaction among people in public places. Experimental evidence shows, in fact, that even very brief encounters between strangers are capable of generating mutual aid. In one experiment, for instance, it was found that people more readily offered assistance to a "victim" staging an epileptic seizure in an adjoining room when they had previously conversed with him than when there had been no prior contact between them at all:

[Those who had spoken with the victim] reported that they had pictured him in the grip of a fit. Apparently, the ability to visualize the specific, concrete, distressed individual with whom one has had some human contact increases the speed and likelihood of one's helping that person (Darley, 1967, quoted in Hackler, Ho, and Urquhart-Ross, 1974:332, italics omitted and punctuation edited).

Even contact without conversation -- including direct eye contact and mere visual exposure -- can make helping behavior more likely between those involved (see, respectively, Ellsworth and Langer, 1976; Piliavin, Rodin, and Piliavin, 1969). Accordingly, physical arrangements designed to encourage mutual awareness and interaction in public places would increase the overall quantity of self-help.

One recommendation consistent with this viewpoint is that public places such as subway and railroad stations be designed to concentrate flows of people (see Tien et al., 1976:172-173). Settings designed in this way -- if not overcrowded -- would enjoy increased natural surveillance, and would also generate situational intimacy conducive to mutual aid. The same effects might be achieved by decreasing the number of bus stops, park bench sites, and other gathering places. Beyond all of this, the physical structure of each public setting might be made as sociopetal as possible. Corridors might be minimized, for instance, and rooms made round instead of angular (see Osmond, 1957). Seating arrangements, whether in terminals, in lobbies, on buses, or on subway cars, might be designed to foster sociability. In general, then, more self-help would occur if

public settings were better designed to encourage strangers to form relationships, however ephemeral these might be.

To summarize: Whatever the location, private or public, and whatever the context, personal or not, the design of a physical setting may have profound implications for the quantity of self-help. And, as noted earlier, once self-help begins, it has a tendency to feed upon itself, growing all the more. Now consider still another strategy by which it is possible to engineer changes of this kind.

Technology

Just as the physical settings inhabited by people may have consequences for their interaction, so may the technological devices with which they act upon the world. Social thinkers have long recognized that such techniques as the means of production, warfare, communication, and transportation have implications for human society far beyond the purposes for which they were intended (see, e.g., Cottrell, 1955; Marx, 1956; White, 1962; McLuhan, 1964; Ogburn, 1964). These include implications for the nature of deviant behavior and social conflict of all kinds, and for the strategies by which they are handled, whether preventive or remedial. Technology affects the degree to which a legal system can penetrate a population, for example (see, e.g., Kaplan, 1965), and it also affects the degree to which people can exercise social control on their own. In this section we discuss the relevance of technology, especially electronic

communications, for the quantity of self-help. We focus specifically upon its relevance for the capacity of people to help one another.

Modern developments in technology have made possible a pattern of social interaction that is largely independent of the distribution of people in physical space. In part this has resulted from the emergence of rapid transportation, and in part from electronics, with the telephone and similar kinds of communication making people instantly available to one another no matter where they are located across the world. This means, as Marshall McLuhan has noted, that life in modern society is coming to share a characteristic with that of simpler societies, in which fellow villagers are always accessible to one another:

Postliterate man's electronic media contract the world to a village or tribe where everything happens to everyone at the same time: everyone knows about, and therefore participates in, everything that is happening the minute it happens....Just as the Eskimo has been de-tribalized via print, going in the course of a few years from primitive nomad to literate technician, so we, in an equally brief period, are becoming tribalized via electronic channels (Carpenter and McLuhan, 1960:xi-xii; see also McLuhan, 1964).

As this "global village" comes into being, with the social distance between people shortening while physical distances remain the same or even increase, social control changes as well. One consequence has been a great increase in the availability of police -- made possible by telephone and radio communications as well as by the automobile -- which allows citizens to have police at their homes within seconds of a request. The same

technology has allowed the police themselves to coordinate their manpower to a degree never before imaginable. Beyond this, new electronic devices are now being developed to increase further the capacity of citizens to mobilize the police and the capacity of the police to exercise social control (see, e.g., Tien et al., 1976:175-178). What has generally not been recognized, however, is how these developments have potential impact on the ability of citizens to handle their own problems. Indeed, the need for the police that is now taken for granted may not be so obvious in a society where citizens are available to each other on a moment's notice.

The potential consequences of electronic communications for self-help go far beyond the possibility of citizens performing the same functions as the police, using the same strategies and tactics, a phenomenon illustrated by the radio-equipped vigilantes who have recently appeared in American cities (see Brown, 1969:201-207; Marx and Archer, 1971). Rather, electronics is able to extend the reach of people into one another's lives, making more mutual aid available across the population. Electronics makes it possible, for instance, for individuals to draw upon their intimates for help whenever trouble arises, wherever they may be. Moreover, electronics may create a wider web of communication, extending to anyone with the proper equipment, through which otherwise distant people may be in touch for as long or as little as they wish. This results in a degree of intimacy among all those who participate, and since helping behavior varies directly with intimacy (see above, page 9), all are in a

position to benefit from mutual aid. In fact, a system of this kind is now growing up around the citizen-band radio.

Though it has been available in the United States for at least 20 years, the citizen-band radio, or CB, has become popular only during the mid-1970s. First adopted among interstate truckdrivers, it is now spreading among American motorists from all walks of life. (For a brief history of the CB radio, see Poushinsky and Dannefer, 1978.) The result has been an emergence of constantly fluctuating networks of people who form and end relationships with each other as they meet and pass electronically across the highways of the nation. And as this community has come into being -- however fragmentary and temporary it might be -- a major consequence has been an extensive system of mutual aid where almost none had existed previously:

The conversational interaction facilitated by the CB radio transforms relationships so that motorists no longer experience each other as atomized, unrelated strangers....Within this situational framework, other drivers are not defined vaguely as malevolent strangers but, quite literally, as "good buddies" who can be relied on for information and aid. It is difficult to emphasize sufficiently how radically this new mode of communication changes the experience of highway travel from the formerly alienated mode....[The CB] network is anonymous but not impersonal. The interactions that sustain it are fleeting but the network itself is permanent. Membership is wide open and in continual flux, but the shared concerns and the willingness to help each other out are genuine (Poushinsky and Dannefer, 1978).¹⁴

It might be added that the system of mutual aid arising from the CB radio is highly egalitarian, with help available to all regardless of their social characteristics. This egalitarianism is possible, perhaps, only because most of the social characteristics of the people in the CB network are unknown to their fellows. Nearly all that is known is that each is a member of the electronic community.¹⁵ What is more, self-help of this kind could operate in other settings.

For instance, electronic technology is now being developed for a portable telephone that can be worn on the wrist or carried in a pocket or handbag (see Rockwell International, 1977:13-14), thereby extending to the streets and sidewalks immediate access to family members, friends, and others who might provide assistance. It should also be possible to design a two-way radio of the same size, with the same functions as the larger citizen-band radio, creating an electronic community in the city among all who happen to tune in, including strangers. What the CB has done for motorists on the highway, devices of this kind could do for pedestrians, fostering a network of concern and putting people within reach of others, able to ask for help or provide it. Still other electronic devices could undoubtedly be invented to make people accessible to each other, further transforming the social life of the city, even tribalizing settings now peopled by strangers. Combined with rapid transportation, these devices would allow citizens to perform services for each other that are ordinarily viewed as the business of the police. Technology makes possible a new kind of order, in which people look after their own affairs.¹⁶

Social Control Through Self-Help

Self-help is a mode of social control with a logic and an organization of its own. Not merely a substitute for other modes such as law, it is rather an alternative with distinctive patterns of mobilization, agent recruitment, procedures, outcomes, and other features. Hence, if self-help were to grow to a new prominence in modern society, it would have a number of implications for the normative life of its host communities.

Perhaps the most significant differences between self-help and law lie in the actual settlements produced by each. In matters of public order, the style of social control¹⁷ found in legal settlements tends toward the penal, with expiation through punishment a standard outcome. It is routine that only one side of any conflict receives this sanction, while the other is vindicated and supported. This penal style has a severity rarely seen in other idioms of social control. Another response of law to problems of public order is therapeutic in style, with people processed as "sick" and in need of corrective treatment, coercively applied if necessary. Self-help, by contrast, is more frequently conciliatory in style. Its settlements are more commonly negotiated between the two or more opposing factions involved in a dispute, both or all of whom make some concessions in pursuit of a resolution (see Gulliver, 1969:67-68). If one of the parties is defined as the greater transgressor, this occurs through mutual agreement, and it is usual for him or her to supply the offended person or group with compensation of some kind, whether in the form of reparation or simply an

apology. It might be added that, since it is generally a compromise reached through give and take rather than a decision imposed upon one party who is defined as a loser, a resolution of this kind differs from civil as well as criminal law. Finally, although civil settlements are as a rule less severe than penal settlements, self-help is still less severe.

Several characteristics of self-help explain these differences. In the first place, self-help is a radically decentralized mode of social control (see Sennett, 1970:164). In many cases, this means that the people immediately involved in a dispute participate in its resolution, and no one else. In other instances, one or both parties may draw upon a network of family, friends, or even situational acquaintances or bystanders for assistance, but this remains much different from the formal organization of law with its headquarters, chains of command, and courts. In criminal cases, moreover, it is the state itself -- a centralized group par excellence -- that brings the complaint. These features are highly consequential in themselves since, all else constant, social control is most penal and most severe where its organization is most centralized, and least where the most decentralization prevails (see Black, 1976:86-91, 98, 101-103). There is even evidence that individuals are less punitive than small groups (see Wolosin, Sherman, and Mynatt, 1975). Accordingly, the relative leniency of self-help, and its conciliatory character, are understandable in light of both its decentralization and the major role of individuals in its settlements.

Another feature of self-help also explains its patterns to some degree. When parties to a conflict do not invoke legal agents of social control, but draw upon others in solving their problems by self-help, they typically seek the participation of people who are closest to and most like themselves. Those with whom the disputants are intimate and with whom they share tastes and experiences thus come to perform a normative role in their lives. Even situationally, people with whom the parties have had some contact -- rather than complete strangers -- are most likely to be solicited for a role of this kind. People relatively intimate with the disputants are also more likely to intervene on their own initiative. For that matter, many disputes are settled by the participants alone, and often they themselves have prior ties of some kind. Theory suggests that social control is least severe and most conciliatory precisely when social-control agents are relationally and culturally closest to the parties with whom they are involved (see Black, 1976:40-47, 55-57, 73-80, 82-83). It is therefore understandable that social control through self-help is quite unlike that exercised by police and other legal authorities, who are usually unknown and often naturally alien to the people whose problems they handle.

In addition to differences in severity and style, still another difference between self-help and law pertains to the variability in settlements arising from each. While there is substantial variability in outcomes at every stage of the legal process, cases handled by self-help vary considerably more.¹⁸ This is a result of the greater diversity of participation across cases handled by people on their own: Legal agents are relatively

homogeneous in background and other social characteristics, whereas the agents of self-help are not. At different times, virtually all citizens -- those of all sexes, ages, ethnicities, occupations, and other categories -- serve as mediators for others and undertake social control on their own behalf. They emerge from throughout the population, make their contribution to social order, and fade back again. Since there is more variability in participation, then, there is more variability in result.

The preceding discussion indicates some of the ways in which self-help differs from law. Yet other differences could be detailed, such as the lesser emphasis upon issues of procedural fairness in a self-help system, the greater importance of personal networks and alliances in it (see Gulliver, 1963:297-301), its lesser orientation toward rules or principles (see Northrop, 1958:349-351; Henderson, 1965:241), and its more immediate resolution of disputes (Gulliver, 1963:233). Nevertheless, it is impossible at this point to be exhaustive or definitive about the changes that would accompany any new growth of self-help. The opportunity for an assessment of this kind depends upon the evolution of social control.

* * *

In the foregoing pages, we have described several means by which self-help might be encouraged in modern society, including systematic depolicing, the design of sociopetal environments, and the introduction of new forms of electronic communication. We have also outlined some

differences between law and self-help as systems of social control. In closing, we might note that our analysis has been concerned solely with the possibilities of applying theoretical and empirical knowledge in this context. It should be understood, however, that any decision to implement a program of self-help must issue from a careful examination of its desirability as a social policy. Although self-help could be a powerful system of public order, there are those who might criticize the means necessary for its attainment, as well as certain of its characteristics and consequences. A world in which people exercise their own social control might seem to entail too little privacy, for instance, and some of the procedures used might seem dangerous or unfair. Furthermore, a decline of law and growth of self-help would not be equally attractive to all segments of society. Those who enjoy special benefits from law might be least receptive to such a development, while others who would gain advantages from self-help might welcome it most. Considerations of this kind cannot be ignored. Nevertheless, these are matters of value and politics, and lie beyond the scope of the present work.

Notes

¹ For these purposes, we define law as governmental social control (Black, 1972:1096), in other words, any process by which the state defines or responds to deviant behavior.

² Social control as a cause of deviant behavior has been a major theme of labeling theory in sociology (for an overview, see Schur, 1971). The conduct so produced has come to be known as "secondary deviation" (Lemert, 1967). The claim that law is especially criminogenic, however, has generally received only implicit recognition.

³ In the following discussion, we use the concept of self-help to refer to any response to deviant behavior in which an offended party takes action on his or her own behalf, with or without the assistance of third parties other than those who are specialized agents of social control.

⁴ It should be added that a condition of mutual hostility has often existed between law and self-help, with each system attempting to prohibit or otherwise discourage recourse to the other. For an example of the legal prohibition of self-help, see Pollock and Maitland (1898:Volume 2, 574-578).

⁵ In modern America, for example, it would appear that self-help is more likely in matters legally defined as civil -- such as consumer complaints against businessmen (see Best and Andreasen, 1977:710-724; Nader, 1978) -- than in criminal matters, where police assistance is readily available to those who choose to make use of it.

⁶ A notable exception is Richard Sennett, who proposes the creation of "survival communities," densely populated and socially diverse urban areas without centralized planning and social control, where people would be forced to work out their own problems with each other (1970: especially Chapters 6 and 7). The need for police in a modern city has also been questioned by Roger Wertheimer (1975).

⁷ It might be observed that, along with self-help, other kinds of non-legal social control -- more organized and specialized kinds -- would be very likely to increase with depolicing. This matter deserves further treatment, but it lies beyond the concerns of the present discussion.

⁸ While self-help would increase throughout society, this would occur at different rates and reach different levels from one social context to another. Such differences would depend upon a number of other factors in each setting, including the degree to which self-help is already developed and the degree to which other social characteristics conducive to its growth are present. Among the latter are intimacy (see below, pages 8-16), and also stratification, homogeneity, and other variables not treated in this paper (see above, page 3).

⁹ Taylor argues that the political theory which claims the state is necessary to prevent chaos -- a theory espoused by Thomas Hobbes and others -- does not necessarily characterize all human behavior in the absence of a state, but more accurately describes "what human behaviour would be like immediately after the state has been removed from a society whose members

had for a long time lived under states" (1976:141). In any event, even such a "war of all against all" would presumably involve self-help to some degree, but it also involves unprovoked violence and predation on a large scale.

¹⁰ These conditions seem more likely to arise when depolicing occurs in the context of community conflict, as when, for instance, the Boston police went on strike in a city strained by underlying ethnic and social-class tensions (see, e.g., Russell, 1975), or, to take an extreme case, when segments of the French population rose up in total revolution (see, e.g., Kinberg, 1935:129-136).

¹¹ The relevance for our topic of the literature on behavior during disasters was suggested by Jan T. Gross.

¹² Humphrey Osmond, who introduced these concepts, defines sociopetality as "that quality which encourages, fosters and even enforces the development of stable interpersonal relationships such as are found in small, face-to-face groups"; he defines sociofugality as "a design which prevents or discourages the formation of stable human relationships" (1957:28). We use the terms somewhat more broadly, referring to the propensity of settings to encourage or retard interaction of any kind, whether stable or not.

¹³ In other words, helping behavior varies inversely with relational distance, where relational distance refers to the extent to which people participate in one another's lives. (This concept is developed in Black, 1976:40-41.) It might be noted that, generally speaking, patterns of helping behavior are opposite to patterns of social control exerted against a deviant.

Thus, people are least likely to exercise social control against their intimates, the very people they are most likely to help in every way, including the exercise of social control on their behalf.

¹⁴ In the same paper, Poushinsky and Dannefer comment that the CB radio also makes possible new tactics of victimization, such as calls for help designed to entrap would-be helpers or responses to people in distress undertaken for predatory purposes. Generally, however, practices of this kind have proven to be extremely uncommon.

¹⁵ Since differentials in helping behavior, social control, and other social processes are often functions of the characteristics of the people involved, such differentials will correspondingly vary with the amount of information about these characteristics present across cases. (In economics, this factor is known as "signaling." See, e.g., Spence, 1974). Thus, individuals are able to be systematically selective in help-giving on the basis of, say, social class or ethnicity, only if they have enough information about potential recipients. As a rule, audio-electronic communications transmit less of this information than face-to-face communications. This explains, for instance, the fact that police responses to citizen telephone calls for assistance are less selective than their responses to similar requests in field settings. Nonetheless, it is possible for information about individual characteristics to be transmitted through electronics, and when this occurs, differences in help-giving occur as well (see, e.g., Gaertner and Bickman, 1971).

¹⁶ In fact, Gene Youngblood has recently coined the term "technoanarchy" for a world of this kind (1970:415-419). In his view, this system is not only possible but even necessary for human survival: "Technology has liberated us from the need of officialdom....Yesterday, man needed officialdom in order to survive. But technology has reversed the process: survival today depends upon the emergence of a natural order" (419, 418).

¹⁷ There are at least four basic styles of social control, or strategies by which people define and respond to deviant behavior. These are the penal, therapeutic, compensatory, and conciliatory styles. For an elaboration, see Black (1976:4-5).

¹⁸ A similar point is made by Philip Gulliver. Contrasting the Arusha of Tanzania, a stateless people, with groups who have law, Gulliver distinguishes two modes of dispute settlement: a "judicial process," where a superordinate official hands down decisions in accordance with established norms, and a "political process," where decisions are negotiated between the parties in dispute without the intervention of an external authority of any kind, and where variability in outcomes is relatively extensive (1963: 297-301).

References

Alexander, Christopher

- 1967 "The city as a mechanism for sustaining human contact."
Pages 60-102 in Environment for Man: The Next Fifty Years,
edited by William R. Ewald, Jr. Bloomington: Indiana
University Press.

Andenaes, Johannes

- 1966 "The general preventive effects of punishment." University
of Pennsylvania Law Review 114 (May):949-983.

Angel, Shlomo

- 1968 "Discouraging crime through city planning." A report prepared
for the National Aeronautics and Space Administration. Space
Sciences Laboratory and Center for Planning and Development
Research, Working Paper Number 75. Berkeley: University of
California.

Arrow, Kenneth J.

- 1972 "Gifts and exchanges." Philosophy and Public Affairs 1
(Summer):343-362.

Best, Arthur and Alan R. Andreasen

- 1977 "Consumer response to unsatisfactory purchases: a survey
of perceiving defects, voicing complaints, and obtaining
redress." Law and Society Review 11 (Spring):701-742.

Bickman, Leonard

- 1971 "The effect of another bystander's ability to help on bystander intervention in an emergency." Journal of Experimental Social Psychology 7 (May):367-379.

Black, Donald

- 1972 "The boundaries of legal sociology." Yale Law Journal 81 (May):1086-1100.

- 1976 The Behavior of Law. New York: Academic Press.

Brown, Richard Maxwell

- 1969 "The American vigilante tradition." Pages 154-226 in Violence in America: Historical and Comparative Perspectives, edited by Hugh Davis Graham and Ted Robert Gurr. A report submitted to the National Commission on the Causes and Prevention of Violence. New York: Bantam Books.

Bryan, James H. and Mary Ann Test

- 1967 "Models and helping: naturalistic studies in aiding behavior." Journal of Personality and Social Psychology 6 (August):400-407.

Carpenter, Edmund and Marshall McLuhan

- 1960 "Introduction." Pages ix-xii in Explorations in Communication: An Anthology, edited by E. Carpenter and M. McLuhan. Boston: Beacon Press.

Cottrell, Fred

1955 Energy and Society: The Relation Between Energy, Social Change, and Economic Development. New York: McGraw Hill-Book Company.

Darley, John M.

1967 "The sharing of responsibility." A paper presented at the American Psychological Association Conference, Washington, D.C., September, 1967.

Darley, John M. and Bibb Latané

1968 "Bystander intervention in emergencies: diffusion of responsibility." Journal of Personality and Social Psychology 8 (April):377-383.

Ellsworth, Phoebe C. and Ellen J. Langer

1976 "Staring and approach: an interpretation of the stare as a non-specific activator." Journal of Personality and Social Psychology 33 (January):117-122.

Gaertner, Samuel and Leonard Bickman

1971 "Effects of race on the elicitation of helping behavior: the wrong number technique." Journal of Personality and Social Psychology 20 (November): 218-222.

Gibbs, James L., Jr.

1963 "The Kpelle moot: a therapeutic model for the informal settlement of disputes." Africa 33 (January):1-10.

Gulliver, Philip H.

1963 Social Control in an African Society: A Study of the Arusha, Agricultural Masai of Northern Tanganyika. Boston: Boston University Press.

1969 "Dispute settlement without courts: the Ndendeuli of southern Tanzania." Pages 24-68 in Law in Culture and Society, edited by Laura Nader. Chicago: Aldine Press.

Hackler, James C., Kwai-Yiu Ho, and Carol Urquhart-Ross

1974 "The willingness to intervene: differing community characteristics." Social Problems 21 (Number 3):328-344.

Henderson, Dan Fenno

1965 Conciliation and Japanese Law: Tokugawa and Modern. Seattle: University of Washington Press. Volume 2.

Hobhouse, L. T.

1951 Morals in Evolution: A Study in Comparative Ethics. London: Chapman and Hall.

Hornstein, Harvey A.

1970 "The influence of social models on helping." Pages 29-41 in Altruism and Helping Behavior: Social Psychological Studies of Some Antecedents and Consequences, edited by J. Macaulay and L. Berkowitz. New York: Academic Press.

Jacobs, Jane

1961 The Death and Life of Great American Cities. New York: Vintage Books.

Jeffery, C. Ray

1971 Crime Prevention Through Environmental Design. Beverly Hills:
Sage Publications.

Kaplan, Irving

1965 "Courts as catalysts of change: a Chagga case." Southwestern
Journal of Anthropology 21 (Summer):79-96.

Kinberg, Olof

1935 Basic Problems of Criminology. Copenhagen: Levin and Munksgaard.

Kropotkin, Peter

1914 Mutual Aid: A Factor of Evolution. Boston: Extending
Horizons Books, 1955 (second edition; first edition, 1902).

Latane, Bibb and Judith Rodin

1969 "A lady in distress: inhibiting effects of friends and
strangers on bystander intervention." Journal of Experimental
Social Psychology 5 (April):189-202.

Lemert, Edwin M.

1967 "The concept of secondary deviation." Pages 40-64 in Human
Deviance, Social Problems, and Social Control. Englewood
Cliffs: Prentice-Hall.

Marx, Karl

1956 Selected Writings in Sociology and Social Philosophy, edited
by T. B. Bottomore and Maximilien Rubel. London: Watts
and Company.

Marx, Gary T. and Dane Archer

- 1971 "Citizen involvement in the law enforcement process."
American Behavioral Scientist 15 (September/October):52-72.

McLuhan, Marshall

- 1964 Understanding Media: The Extensions of Man. New York:
New American Library.

Mileti, Dennis S., Thomas E. Drabek, and J. Eugene Haas

- 1975 Human Systems in Extreme Environments: A Sociological
Perspective. Boulder: Institute of Behavioral Science,
University of Colorado. Program on Technology, Environment
and Man, Monograph Number 21.

Nader, Laura

- 1978 "The direction of law and the development of extra-judicial
processes in nation-state societies." Forthcoming in Cross-
Examinations: Essays in Memory of Max Gluckman, edited by
Philip H. Gulliver. Leiden: E. J. Brill.

Newman, Oscar

- 1972 Defensible Space: Crime Prevention Through Urban Design.
New York: Macmillan Company.

Northrop, F. S. C.

- 1958 "The mediational approval theory of law in American legal
realism." Virginia Law Review 44 (April):347-363.

Ogburn, William F.

- 1964 On Culture and Social Change: Selected Papers, edited by
Otis Dudley Duncan. Chicago: University of Chicago Press.

Osmond, Humphrey

- 1957 "Function as the basis of psychiatric ward design." Mental
Hospitals 8 (April):23-29.

Piliavin, Irving M., Judith Rodin, and Jane Allyn Piliavin

- 1969 "Good samaritanism: an underground phenomenon?" Journal of
Personality and Social Psychology 13 (December):289-299.

Pollock, Frederick and Frederic William Maitland

- 1898 The History of English Law: Before the Time of Edward I.
Cambridge: Cambridge University Press, 1968 (second edition;
first edition, 1895).

Poushinsky, Nicholas and W. Dale Dannefer

- 1978 "Band together citizens: a new medium and a transformed road."
Journal of Popular Culture, forthcoming.

Rockwell International, Space Division

- 1977 Industries in Space to Benefit Mankind: A View Over the
Next 30 Years. Los Angeles: A report prepared for the
National Aeronautics and Space Administration.

Russell, Francis

- 1975 A City in Terror: 1919--The Boston Police Strike. New York:
Viking Press.

Schur, Edwin M.

- 1971 Labeling Deviant Behavior: Its Sociological Implications.
New York: Harper and Row.

Sennett, Richard

- 1970 The Uses of Disorder: Personal Identity and City Life.
New York: Random House, 1971.

Singer, Peter

- 1973 "Altruism and commerce: a defense of Titmuss against Arrow."
Philosophy and Public Affairs 2 (Spring):312-320.

Sommer, Robert

- 1969 Personal Space: The Behavioral Basis of Design. Englewood
Cliffs: Prentice-Hall.

Spence, A. Michael

- 1974 Market Signaling. Cambridge: Harvard University Press.

Tannenbaum, Frank

- 1938 Crime and the Community. Boston: Ginn and Company.

Taylor, Michael

- 1976 Anarchy and Cooperation. New York: John Wiley and Sons.

Tien, James M., Thomas A. Reppetto, and Lewis F. Hanes

- 1976 Elements of CPTED (Crime Prevention Through Environmental
Design). Arlington: National Issues Center, Westinghouse
Electric Corporation (second edition; first edition, 1975).

Titmuss, Richard M.

- 1971 The Gift Relationship: From Human Blood to Social Policy.
New York: Pantheon Books.

Wertheimer, Roger

- 1975 "Are the police necessary?" Pages 49-60 in The Police in Society, edited by Emilio C. Viano and Jeffrey H. Reiman.
Lexington: Lexington Books.

White, Lynn, Jr.

- 1962 Medieval Technology and Social Change. Oxford: Clarendon Press.

Wilson, James Q.

- 1974 "The police and crime." Pages 81-97 in Thinking About Crime.
New York: Basic Books, 1975 (originally published as "Do the police prevent crime?").

Wolosin, Robert J., Steven J. Sherman, and Clifford R. Mynatt

- 1975 "When self-interest and altruism conflict." Journal of Personality and Social Psychology 32 (October):752-760.

Wood, Elizabeth.

- 1961 Housing Design: A Social Theory. New York: Citizens' Housing and Planning Council of New York, Inc.

Youngblood, Gene

- 1970 Expanded Cinema. New York: E. P. Dutton and Company.



Territoriality and Residential Crime:
A Conceptual Framework¹

Barbara B. Brown and Irwin Altman
University of Utah

Introduction

Architect Oscar Newman's (1972) theory of "defensible space" in urban settings has stimulated considerable interest in environmental design factors in relation to crime. Newman's thesis is that certain design features of urban housing developments can affect the probability of various types of criminal acts. Design features that contribute to "defensible space" involve clear articulation of boundaries between totally public and totally private spaces. Such design qualities, in turn, promote residents' feelings of territorial control and capability of surveillance of spaces in their residential environment.

The present paper proposes a conceptual framework that relates to but goes beyond Newman's ideas in several ways. Specifically, we will present: (1) a framework that extend Altman's (1975) analysis of privacy and territory, (2) a conceptual model that emphasizes a sequential decision-making process used by burglars trying to select appropriate residential targets, and (3) a classification system for quantifying the nature of the information sought in the sequential decision-making process. Our general model depicts the burglar as attending to certain environmental/behavioral qualities of a residential area while making a series of decisions about particular blocks,

¹Paper prepared for Westinghouse National Issues Center project on Crime Prevention through Environmental Design.

sites, and houses. In addition, our analysis may provide a new perspective on residential burglary in the suburbs. Specifically, our approach will stress the types of environmental/behavioral information the burglar seeks in order to arrive at decisions regarding the territorial nature of an area.

The first section of the paper outlines some ideas offered by Altman (1975) in relation to privacy and territory. The remaining sections of the paper outline a sequential decision-making model and a classification system that can be used to translate and test the model at an empirical level.

Privacy: A Fundamental Concept

A major underpinning of the present paper is that privacy is a central construct concerned with the regulation of self-other boundaries, and that territoriality is one of several mechanisms used to facilitate privacy control. The present section explores this theme in terms of properties of privacy regulation and its relation to concepts of territory, personal space, and so forth.

Privacy as a Dialectic, Boundary Regulation Process

Some prior analyses of privacy contain a number of implicit assumptions that Altman questioned (1975). For example, a traditional approach has been to view privacy as either a "keep out" or "keep in" process, whereby people attempt to prevent outside stimulation from reaching them or personal information about themselves from becoming available to others. Thus designers build walls, sound-reducing features, etc., into environments to "keep out" undesired stimulation. And, political scientists, lawyers and philosophers have been concerned with privacy invasion in the form of inappropriate access to personal information. Altman viewed these approaches as incomplete and

defined the concept of privacy as "the selective control of access to the self" (Altman, 1975). There are several implications of this definition, the most important being that privacy is a boundary regulation process concerned with the interface of the person or group and the social and physical environment. The idea of "selective control" means that people do not act in a singular way toward their environment, i.e., only shutting it off, but that they selectively close or open themselves to social and physical stimulation. Thus, privacy regulation is a process whereby people make their self-other boundaries permeable on some occasions and impermeable on other occasions.

Privacy as a Multi-Level Behavioral Process

A second assumption made by Altman is that people use a variety of behavioral mechanisms to control openness/closedness or privacy. These mechanisms include verbal, nonverbal, cultural and environmental styles of behavior. Thus, through verbal behavior we let others know of our desire to interact or to not interact, e.g., "Let's talk," "Can I raise an issue with you?" "Sorry, I'm too busy now." Or through use of a "cool" or "warm" way of speaking, so-called paraverbal communication cues, we convey our accessibility or inaccessibility to others. People also use nonverbal behaviors to reflect openness or closedness--nodding the head, smiling, leaning forward, relaxed body postures, frowning, looking away, rigid symmetrical body positions. Personal space also serves as a boundary regulation mechanism used to achieve a desired distance from others. Cultures also have customs, rules, and norms for regulating accessibility. In the present-day United States, we do not "drop in" on friends too early in the morning or too late in the evening. We generally do not barge through locked doors; we are careful not to intrude

on others; we have cultural practices to reflect dissatisfaction with intruders. Finally, territories, or places over which a person has control, also assist in privacy regulation. We invite others to our territories; we shut off places from others; we open or close doors; we use signs that say "keep out" or "welcome" and so on.

The various privacy mechanisms work in profiles and patterns, not separately. People use various mixes or combinations of behaviors to communicate desires for interaction or withdrawal. Sometimes emphasis is placed on verbal behaviors, sometimes on nonverbal behaviors, sometimes on a combination of two or three classes of mechanisms.

Privacy regulation is an important aspect of human functioning, especially in regard to social interaction. The ability to pace and control contacts with others through a variety of mechanisms is essential to smoothly operating contacts between people. As Altman (1975) noted, failure to achieve a reasonable degree of regulatory control over dealings with others can have important implications for the viability of a group or person. Therefore, the ability of a person or group to regulate access to their territories is an important facet of social behavior.

To summarize, Altman's approach views privacy as a dialectic, boundary regulation process involving differential self—other boundary permeability to the social and physical environment. Furthermore, he assumes that privacy regulation involves the interplay of verbal, nonverbal, environmental and cultural behaviors that are designed to optimize momentarily a desired degree of access to the physical and social environment. Within this framework, we will focus on territoriality as an important privacy regulation mechanism.

This brief overview of Altman's approach to privacy is important to the present paper because it casts the concept of territoriality, to be discussed in more detail next, in a general conceptual framework. Furthermore, it depicts territoriality as one of a variety of behavioral mechanisms that operate in the service of boundary control. As the central framework of this paper will illustrate, the process of burglary in relation to residential homes is portrayed as involving a sequential decision-making process by potential burglars. This process involves assessments about the permeability/openness/accessibility of various boundaries in the residential environment. This assessment involves an examination and weighing of behavioral and environmental mechanisms that are used and displayed by people to indicate the degree of openness or accessibility of their communities and homes to outsiders. Thus, territorial practices by residents and others are reflections of boundary permeability and accessibility and, as such, cast the problem of territorial intrusion within the model of privacy outlined above.

Territorial Behavior

Altman (1975), in a review of the literature on human and animal territoriality, identified a number of consistent themes: (1) Territories can belong to individuals or groups, (2) Territories are geographical areas that are often marked and personalized, (3) Territories function in the service of a variety of needs and motives including child rearing, food gathering, sex, mating, and a variety of social functions such as status, resource control, etc., (4) Territories serve as boundaries that allow selective control over who may see, hear, or participate in an activity, and (5) If invaders cross territorial lines, defensive responses may range from threats to overt aggression.

As a generic definition, Altman (1975) stated:

Territorial behavior is a self/other boundary-regulation mechanism that involves personalization of or marking of a place or object and communication that it is "owned" by a person or group. Personalization and ownership are designed to regulate social interaction and to help satisfy various social and physical motives. Defense responses may sometimes occur when territorial boundaries are violated. (p. 107)

Although most territories exhibit certain of the preceding qualities, all territories are not alike. Altman (1975) described three types of territories distinguished by their values along the dimensions of temporal duration and centrality (see Table 1).

Primary territories are typically occupied for long periods and are central to the lives of their owners (e.g., homes, bedrooms). *Secondary territories* are somewhat more accessible to a greater range of users, but regular occupants exert some control over who may enter a territory and what range of behaviors may take place. Although there may be regular users, such as bar "regulars" or members of a country club, the time spent within a secondary territory is usually somewhat more limited than in a primary territory. The limits of occupancy are not solely determined by the users, but by collective owners of secondary territories. Furthermore, secondary territories, while important, are generally not as central to the lives of their occupants as are primary territories. *Public territories* are usually occupied for short times and are typically not very central to the lives of their occupants (e.g., seats of a bus, tables in a restaurant). Occupancy of public territories is open to almost everyone and is usually determined on a "first come, first serve" basis.

Altman (1975) noted that secondary territories are potentially susceptible

to misinterpretation of ownership and can easily generate conflict because of their ambiguous mix of public and private use. Such territories fit well with Newman's (1972) analysis that semipublic areas not clearly demarcated as belonging to a group may foster the intrusion of others. Similarly, Altman (1975) hypothesized that poorly marked secondary territories might be more amenable to overlapping use by a variety of users and, consequently, might be associated with considerable conflict and disruption. Primary territories, on the other hand, are typically well-known and easily identified and, except in certain circumstances, are not susceptible to intrusion. Similarly, areas which are clearly public territories, when identified as such, are so transitional in their use and typically so unimportant to the lives of the users, that conflict is probably relatively rare. Naturally, when a group redefines a public territory, such as a beach or park, as a secondary territory, conflict may ensue, especially when others view it as a public territory and/or their own secondary territory.

To summarize, Altman defined primary, secondary, and public territories in terms of qualities of centrality and duration. Owners of territories can usually distinguish between their own public, secondary, and primary territories in terms of the duration of their use and centrality to their lives. But for the purposes of this paper, we are interested in how an outsider judges the territorial quality of an area. In order to make this clear, we have expanded the conceptual distinctions between the three types of territories described above. The purpose of this conceptual distinction is twofold: (1) to provide dimensions that an outsider might use in deciding on the level of territoriality, and (2) to illustrate why it would be important for a burglar to attend to the level of territoriality present in a given setting.

A third dimension along which territories may vary, shown in Table 1, is

the intent with which owners mark a territory. Primary territories are often personalized, marked or decorated for the purpose of self-expression. For example, posters and pictures hanging in a bedroom are not necessarily put there to say, "This is my room, keep out." Instead, decorative items are often chosen because they express personal values or interests. However, a primary territory might also be consciously marked to fend off potential invaders. For instance, if a resident of a primary territory has suffered repeated invasions, then marking with the sole intention of staking out a territory might occur. Or, a primary territory may be intentionally marked in advance or at the time of occupancy as a way of forestalling potential invasions. Signs, fences, locks on doors and other manifest boundary markings are often used in primary territories, along with indicators of personal expressions.

Secondary and public territories are usually marked with the intention of showing ownership over a place. Rarely are secondary or public territories marked to exhibit personal expression, although this sometimes does occur. Club houses, country clubs, neighborhood bars sometimes contain personalized expressions such as photographs of members, community activities, and other indications of group cohesion and unity. However, secondary territories are more often visibly marked in order to regulate and control access. Fences around a country club, signs stating "members only," graffiti on walls in areas gangs claim as their "turf" are all explicit attempts to indicate ownership of secondary territories. While primary territories probably are personalized and marked for the purposes of both self-expression and boundary control, we hypothesize that secondary territories tend to be marked more for the purpose of territorial control than for self expression. Similarly, we hypothesize that marking public territories largely serves the purpose of ownership,

occupancy and control. Because of their transient nature, only temporary markers can be used in public territories, e.g., a person might leave a coat to "guard" a theater seat. Research in library settings and other public places indicates that such personal markings communicate ownership of territories and serve to protect them for at least limited amounts of time. There is no evidence that marking public territories serves the function of self-expression in the same way that it does in secondary and primary territories. Thus, primary, secondary and public territories not only differ in duration and centrality but also in the functions served by markers.

A fourth dimension depicted in Table 1 concerns the range, type and mix of markers that are used in various territories. Variations in marker characteristics may reflect the three dimensions of territoriality discussed above. That is, the type of marker provides clues as to the intended duration of ownership of a territory, its centrality and the motivations of its occupants. For example, primary territories, because of their centrality and durability, often contain markers reflecting personal expression and personal characteristics of their occupants. The markers themselves may appear to reflect more central values, may be more durable, and may portray the basic characteristics of their owners. Furthermore, since such territories are long-term, the markers need not be portable and can vary in size, permanency and attachment to the territory itself. Fences, furnishing, permanent name places, and other markings may communicate duration, importance and personal character. The markers communicate these distinctions by variations in duration, importance, and personal character, and by their size, monetary value, and range of types.

Because of the greater degree of control over accessibility to primary territories, residents tend to expect respect for and proper usage of their markers and personalizations, and they generally feel quite safe in displaying

them. Thus, a general characteristic of markers and personalizations on primary territories is the degree to which they can represent actual, not just symbolic, barriers. The owner of a primary territory, such as a home, is free to erect walls, install locks, post guards, etc. Or, the owner may use no physical barriers but only a series of symbolic barriers, e.g., signs, hedges, decorations of various kinds.

In secondary territories, the markers used to signify ownership are typically not of the same degree of permanency, value, size, or importance to the residents. In addition, the erection of actual barriers by individuals is not permitted in many secondary territories, although a group or community itself may erect barriers. In some cases markers may be valuable monetarily, e.g., expensive signs or medallions on club houses, country clubs, etc., and the secondary territory may require constant surveillance and guarding by hired guards, alarm systems and the like. Thus, secondary territory owners usually recognize the need for markers to defend the area, especially when the territory is temporarily vacated, e.g., at night, on holidays, etc. Because of this vulnerability of secondary territories, an attempt is often made to provide physical protection of the place and/or (as in neighborhood gang areas) to avoid expensive and/or removable markings.

A public territory is almost always defended with occupancy and/or minimal markers. Residents of public territories typically put little faith in the ability of removable markers to protect their territories, other than on a short-term basis, and they usually do little more than leave a symbol of their presence for short periods of time, e.g., coats, books, etc. But even such symbols are not left in certain places for fear of their being stolen. Because a public territory does not typically have a long-term or central value to occupants and is only claimed in order to get something

accomplished momentarily, physical markings are usually quite limited. Rarely are valuable personal markings ever used in public territories. Also, people do not ordinarily use permanent barriers to claim and/or protect public territories, e.g., one cannot chain a chair or lock up a telephone booth in one's absence. In public territories people typically use more temporary claims to space, such as verbal and nonverbal behaviors and single physical objects.

A fifth dimension along which territories vary, shown in Table 1, involves owner reactions to invasion or intrusion. In general, the impact of an invasion on occupants, and the range and effectiveness of their defensive reactions increase as the territory becomes less public and more primary. To invade a primary territory essentially requires that the intruder ignore the salient signals and markings of a primary territory. In fact, it is often physically difficult to intrude on a primary territory without ignoring and/or deliberately crossing actual and symbolic barriers that reflect ownership. Therefore owners of primary territories in our culture may assume that any intrusion is more or less intentional, and it is quite legitimate to counter intrusion of primary territories by rather vigorous means, including physical retaliation. The invasion of a primary territory is quite serious for a number of reasons: the markers in the territory and the territory itself may be valuable; the place symbolizes uniqueness and personal identity of the owner; the owner may have no territory left to retreat to after the primary territory has been invaded. Thus, for economic, physical and psychological reasons, intrusions into primary territories in our society are serious matters. As a result, reactions to invasions are often strong. Not only are there personal and social norms that permit strong defensive responses, but legal force exists on the side of the owner as well.

Secondary territories, with their mixture of public and private use, lower importance to the owners, and less clearcut evidence of marking and personalization, may be more susceptible to intrusion. The motive for invasions may be quite variable, ranging from a deliberate attempt at intrusion to an accidental invasion. Similarly, the reactions to invasion may vary considerably, depending upon the degree to which the occupants of the particular secondary territory perceive it as their own, identify with it, and feel that they have adequately marked it. Reactions to an invasion will also be affected by the motives that owners attribute to the intruders.

When a public territory is invaded, the owner has some, but only minimal, "rights" to the territory. Furthermore, because such territories are not usually central to either the intruder's or occupant's life, invasions of public territories are not responded to vigorously. Of course, there are exceptions to this, as when a fight breaks out over competition for a seat or table at a restaurant, but these are unusual circumstances. People on either side—invaders or occupants—tend to resolve intrusions over public territories by retreating. Because public territories are neither very durable nor very central, defense and/or successful invasion is not terribly crucial to owners or intruders. In fact, our society has normative sanctions against people who "make a public scene" over something that is really not theirs to begin with. If an owner wants to protect a public territory, very little can be done with literal physical barriers, i.e., one can do little to mark or protect a table in a restaurant, short of leaving one's coat or using a "Reserved" sign. Rather, temporary owners of public territories usually have to resort to bodily and verbal reactions to re-establish claims and/or to symbolically mark such places with coats, etc.

In summary, primary, secondary, and public territories can be described

in terms of dimensions of durability, centrality, marking intentions, marking range and type and defensive responses.

The conceptual framework of this paper, described in the next sections, is built around homes, sites, and blocks of residential communities in relation to the preceding characteristics of territories. Our basic thesis is that neighborhoods, streets, sites, and houses may communicate different degrees of territoriality as defined in Table 1. Further, the more an area communicates a public territorial quality, the greater the probability of a burglary.

A Conceptual Model of the Burglary Process

The remainder of the paper builds on the preceding concepts of privacy and territory and presents a theoretical model of the burglary process. The model emphasizes the following elements (see Figure 1):

1. The process of residential burglary involves a series of sequential decision-making judgments by the burglar about the probable success he or she may encounter in crossing a series of boundaries surrounding any residence. Our hypothesis is that, implicitly or explicitly, a burglar makes successive decisions about the likelihood of successfully traversing various boundaries to enter a given residence, and then retraversing those boundaries to insure successful exit. At any point in the sequence, a judgment of potential success will increase the probability of consummating the burglary, and a "no success" judgment at any point increases the probability of aborting the burglary.

2. The decision sequence involves successive judgments about (a) a particular street, (b) a particular house site or lot, and (c) a residence itself. That is, the model assumes, in the ideal case, that (after selecting a particular neighborhood) a potential intruder makes three decisions about

the probable success of boundary crossings. First the burglar makes a decision about successfully traversing the boundary represented by a street, then judges the likely success of traversing the boundary represented by a home site or lot, and finally, the burglar determines the likelihood of successfully crossing the boundary of the home itself. Successful crossing of these boundaries means that the burglar is ignored, is not stopped by an observer, or traverses the boundaries without apprehension by the police or others.

3. The model does not necessarily assume that a burglar makes a judgment about the potential success of crossing boundaries one at a time. It is quite likely that "casing" a house involves simultaneous assessments about the neighborhood, street, site, etc. In addition, it is likely that the process of exiting from a house, across a site or lot, out of a block or neighborhood is also included as part of the total process. But for the sake of the model, we will assume that these judgments generally occur in a sequential fashion, with primary emphasis given to a particular boundary at a given time.

4. The model also hypothesizes that the judgment made by a potential burglar relates to the openness/closedness or degree of accessibility of the street, site, and home. More specifically, it is hypothesized that a potential burglar will use a series of cues, described in the next section, to make a judgment about the openness/closedness of a particular boundary. These cues will also indicate the degree to which a particular boundary area is a public, secondary, or primary territory.

Specifically, we predict that:

A. To the extent that a potential intruder identifies any boundary as a public territory, based on its territorial cues, the probability is increased that the boundary will be crossed, given the fact that the public territories

are typically available to most members of society. In addition, as noted earlier, intrusions of public territories are ordinarily not reacted to with strong defensive responses by occupants. Thus, to the extent that a neighborhood and street (and perhaps even a home site) are judged by a burglar to be public territories rather than secondary or primary territories, the potentiality for intrusion is greater. However, to the extent that a neighborhood and street are judged as secondary territories, based on cues noted later, the likelihood of intrusion is less. As noted below, certain places, e.g., streets and home sites, do not have unequivocal meaning as public or secondary territories; they can assume either property based upon certain cues evident in these areas. Similarly, if a home site is viewed as a primary territory, the intrusion may not occur, or may be more carefully accomplished than if the home site is viewed as a secondary or public territory.

B. Within each of the three types of territoriality, the more richly and articulately marked an area, the less the probability of intrusion. Thus, the potential burglar who views the public territory of a street that is visibly marked as a public territory, or a home site clearly marked as a secondary or primary territory, and a home evidently delineated as a primary territory will be less apt to intrude across such boundaries. Such articulate cues described below, may suggest that the occupants and owners of the various areas are especially sensitive to boundary intrusions.

In summary, our conceptual model hypothesizes that potential intruders, especially experienced burglars, make a series of sequential judgments about the territorial qualities of neighborhoods and streets, lots and sites, and homes that are potential targets.¹

Environmental Indicators of Boundary Accessibility

The present section elaborates on the model presented above, in relation to the specific cues and combination of cues that are employed by potential intruders to select targets. Brantingham and Brantingham (1977) have also conceptualized burglary as a process involving sequential decisions based on cues emitted from the environment. Through experience, they state, burglars learn to connect cues, cue sequences, and cue clusters into mental "templates." These templates are then used to judge the adequacy of future targets. We hypothesize that such cues are employed by potential intruders to assess the openness/accessibility of various boundaries. Table 2 presents a classification of cues that are associated with each boundary. The discussion below describes these cues in relation to the hypothesized decision making sequence. Based on an integration of information regarding these cues the intruder is hypothesized to make a judgment about the level of territoriality of the area and the likelihood of successful penetration of streets, lots, and homes.

As shown in Table 2, one cluster of environmental cues concerns *actual and symbolic environmental barriers* (Newman, 1973). Actual barriers are physical qualities that literally impede access to and egress from a site. They include locks, gates, fences, walls, electronic security and other environmental barriers designed to physically keep people out of an area. A slight modification of the Newman definition of actual barriers that is included in our taxonomy refers to access difficulty, i.e., the burglar's initial distance from the target, and familiarity with the area. Initially remote locations of a burglar from a particular area, coupled with an absence of knowledge of the area have been shown to decrease the probability of burglary for such geographical locations (Capone & Nichols, 1975, 1976; Harries, 1974).

The use of actual barriers such as fences, locks and walls are most often employed on territories that are legally owned by occupants and that function as primary territories. Of course, some secondary territories employ actual barriers (i.e., fences and security systems of country clubs, private organizations, certain protected communities, etc.). Furthermore, even public territories occasionally have actual barriers, e.g., parking lot gates, public pay beach areas, toll booths. In general, the greater the number of visible actual barriers, the greater the likelihood that a potential intruder will weigh carefully the risks of entry and/or the skills needed for successful intrusion.²

Symbolic barriers are physical variables that do not restrain access directly but serve to communicate territoriality, ownership, and occupancy. Symbolic barriers range from decorative mailboxes or doors and name plates to flower beds and the like. The wider the range of symbolic barriers and the more personally valuable the markers, the greater the feeling of occupants' territoriality and concern with the place. Thus, the number, variety and quality of symbolic barriers is apt to indicate lessened potential for penetration of the area.

In general, then, we hypothesize that the more highly defined a residential area, by some combination of symbolic and/or actual barriers, the more the place is likely to be viewed by its occupants as a primary or secondary territory—a place that is important to them, and one whose intrusion upon they will react to strongly. Thus the greater the number, clarity, articulation and evidence of barriers, the less probable is intrusion by a potential burglar who, we hypothesize, will be sensitive to such cues and to the role of territorial occupants in relation to intruders.



CONTINUED

1 OF 7

Detectability, another dimension of the classification system in Table 2, deals with the degree to which residents of an area can detect or sense invaders and how well potential intruders can detect territorial users and related neighbors. As shown in Table 2, there are physical design characteristics, geographical features of an area, and relative locations of users and invaders that influence detectability. Physical design variables include the positioning of house doors and windows relative to other houses and relative to the position of potential intruders of the street. Detectability also depends on characteristics of the terrain, natural cover, etc. Generally, a burglar is interested in seeing into potential target areas while minimizing his/her own visibility to others. Not only is the burglar interested in remaining unseen, but he/she also wishes not to be heard. Therefore, noise qualities of the area, e.g., gravel roads, snow, and heavy shrubbery, are important to detectability. Another factor involved in detection capability relates to the behavioral activities of the neighborhood. Although the design of the house may enhance road visibility, such a quality has little value unless residents and neighbors tend to look out at the road and street. That is, it is not only important to assess the amount of detectability which is physically possible because of certain design features of an area, but a burglar must also be sensitive to the degree to which people take advantage of the detectability potential of a place.

Traces, another dimension of our taxonomy, refers to the actual or implied presence of territorial users. Actual presence is communicated when the burglar sees or hears people on the block, site, or in the target house. Implied presence is communicated by clues of occupancy such as the presence of parked cars, mail that has not been picked up, accumulations of newspapers, etc. On the site itself, clues may include working sprinklers, lawn tools or

toys scattered about. Within the house, a burglar may see traces of the presence of people, e.g., lights, radios and television, etc. Of course, the burglar is most interested in assessing the actual presence of people. If actual presence cannot be determined at a particular step in the sequential chain, then the burglar must judge according to traces which imply presence or absence of people.

Social climate is still another set of cues that are used to infer territorial accessibility. Social climate refers to the extent to which people exhibit shared concern for an area and for what type of behavior is permitted by strangers. It reflects their identity with the community and with neighbors on the block. A positive social climate will indicate that the block residents consider the street to be a secondary territory, one that is occupied, controlled and identified with the street or community. Indicators of positive, shared social climate include visible interaction between residents, as well as active defense responses, e.g., when neighbors stare, question or respond to strangers on the street or in the vicinity of a home. A low degree of social climate would be evidenced by neighbors who see each other but do not interact or who see a potential burglar but do not react visibly.

Internal Factors Influencing the Sequential Process of Burglary

We have presented a decision-making model of the burglary process and a taxonomy of physical and behavioral cues used in that process in a relatively "puristic" way. We have adopted an "other-things-being-equal" set, when, in fact, it is obvious that territorial intrusion is more complex than has been described thus far. In this section, we discuss a number of factors that affect the rate and nature of the decision-making process. The factors discussed in the next section are external to the decision-making sequence

and impinge upon it. Here we examine a number of factors that are intrinsic to the process itself.

First, we described the burglar's decision-making process as if it were a step-by-step sequence of events, each step relatively independent of the other and each assessment of a boundary area made independent of subsequent assessments. Obviously, this is not the case in the real world. Though a burglar may, for example, first attend to a street and its behavioral characteristics, and then to a site and its characteristics, and so on, the process is not that categorical. Rather, it is likely that burglars make assessments of blocks, sites, and homes simultaneously, based on whatever information is available from the vantage of the burglar's momentary location. Thus, from the street it may be that most cues are about the street, with a smaller number of cues available regarding sites and houses. Nevertheless, it is likely that the burglar attempts to integrate as much information as possible about all areas before moving along in the decision-making process. Similarly, it is probable that a burglar simultaneously evaluates access and egress and does not wait until he or she is in the home to begin evaluating egress possibilities.

Second, the variety of behavioral and physical design cues present in the classification system should not be considered as operating in a strictly linear and additive fashion. The five dimensions of the category system and their behavioral cues are interdependent and interact with one another in complex and as yet unknown ways. Thus, one cannot additively combine variables and come to the conclusion that "the more the better." It may well be that certain physical and behavioral characteristics may be additive or multiplicative, whereas others may counteract one another. For example, a house with many symbolic barriers such as trees and hedges may indicate the existence of

an important secondary or primary territory. However, if a burglar successfully passes that barrier, his/her detectability by neighbors drops sharply, by virtue of the very presence of those barriers. Or, a home well-guarded by actual barriers may be impervious to burglary regardless of the nature and number of symbolic barriers, detectability or social climate. And, a street with a negative social climate may be quite open to intrusion even if detectability factors are extraordinarily high. These complex interactions -- of different combinations of cues makes it impossible, at the present time, to infer simple additive or linear relations between variables.

Another factor that complicates the model concerns the flow of events in a burglary sequence. The model assumes that the burglar goes through a stated sequence of events and that the whole environmental system remains relatively static. The fact is, however, that the very nature, weighting and impact of actual and symbolic barriers, detectability, etc., changes at different stages in a burglary sequence. For example, the detectability characteristics of a given street may be quite high, e.g., a straight street that has houses relatively close to the street, people walking on the street, children playing, people in yards, etc., all of which make a potential burglar quite visible to residents. But, a particular site surrounded by heavily wooded trees and shrubs may make a particular house and site not visible to neighbors. If a burglar happens to successfully penetrate beyond the street onto the site, he/she is no longer visible to people on the street and the detectability danger drops enormously. And, if no one is at home, the surrounding tree barrier serves as a protective screen for the burglar's activities. Naturally, penetrating the street successfully may have a lower probability in such situations and successful egress onto the street later in the sequence may also be a difficult matter. The point is, however, that

a factor such as detectability can change dramatically with the flow of events associated with burglaries, and one must be careful to reassess changes in visibility, detectability and other characteristics at different stages of a burglary sequence. As yet, the model hypothesized in this paper does not deal with such complexities.

External Factors Influencing the Sequential Process of Burglary

In addition to internal factors of the sequential decision-making process itself, there are a number of external variables that may affect the rate, nature and dynamics of the decision-making process. These factors relate to the general ecological context within which the decision-making sequence operates and include: characteristics of burglars, payoff characteristics of the target, and general environmental factors.

Characteristics of burglars. The model is restricted to potential burglars who fit the assumptions made by Shover (1971) and Letkemann (1973)—rational, goal-oriented, and experienced rather than irrational, impulsive, or inexperienced burglars. As burglars gain more experience they undoubtedly become increasingly sensitive to the kinds of cues and the decision-making process portrayed in our model, and they would be motivated to successfully complete a burglary without detection and/or apprehension. We also assume the existence of certain physiological and motivational states of potential burglars. That is, the model applies to burglars who do not work under the influence of drugs or alcohol. Drug or alcohol users may not assess the environment in the same way as non-users, and users may attend to totally different variables or to the same ones with less sensitivity. In addition, drug users, for example, may be willing to make more risky decisions or judgments concerning targets or burglary procedures. Indirect evidence for

this appeared in our own informal interviews of experienced burglars, who indicated that drug users as partners were unreliable and unpredictable. Letkemann (1973) also reported that burglars believed alcoholics to be bunglers and other drug users to be excessively daring.

In addition, career burglars are assumed to be working for a profit, while other burglars may be working for different motivations and are excluded from our analysis. Scarr (1972), in a review of the literature, identified many different burglary motives, e.g., desire for excitement, peer group approval, status needs, expression of frustration, etc. Brantingham and Brantingham (1977) consider such diverse needs as stemming from either instrumental or affective motivation. They state that criminals operating from affective motivations engage in an abbreviated decision making process prior to target selection. Criminals operating from instrumental motivation engage in a multi-stage decision making process that involves careful searching for appropriate targets. Our model fits the instrumentally motivated burglar interested in profit. The affectively motivated burglar may neither be attending to social/environmental cues nor interested in escaping detection. Because such motivational states may conflict with our assumptions about the sequential decision-making process, sensitivity to cues, and desire to avoid apprehension, the model presented earlier is restricted to experienced, professionally-motivated burglars interested in profit rather than a whole variety of secondary motives,

The general experience and history of success of a given burglar also is an important consideration. Although a rational burglar may be presumed to want to balance profit against risk, what is seen as risky may shift with experience. Reppetto (1974) found that young burglars preferred easily accessible targets while older burglars preferred more difficult but more

profitable targets. Perhaps inexperienced burglars respond more to the symbolic barriers of an area (its "Keep out" message), while more experienced burglars may have learned to size up the target in terms of actual, not symbolic, barriers to success. For example, an experienced burglar may find camouflage provided by hedges and trees at a boundary of a lot to appear less foreboding than would an inexperienced burglar.

Potential payoff of a burglary. Another factor that may affect the rate and probability of intrusion, briefly mentioned earlier, concerns the potential payoff of a successful burglary. It might be expected that burglaries involving higher payoff in terms of worth of items, ability to carry the items out of the house and to transport them unnoticed, ability to avoid items being traced, ease of fencing stolen items, etc. contribute to differential "payoff" values of a burglary. Other things being equal, the higher the potential payoff value, defined in terms of the preceding gain/risk factors, the greater the likelihood that a burglar will proceed through the total decision-making sequence. Thus, given equivalent actual and symbolic barriers, levels of detectability, etc., an experienced burglar may be more willing to choose low risk/high payoff burglaries than the converse. And, as noted earlier, it may be that certain symbolic or actual barriers may signal to an experienced burglar greater payoffs, thus complicating the process. In any case, other things being equal, the greater the potential payoff and the lower the risk, the more probable the completion of the total decision-making sequence leading to a burglary.

Environmental factors. There are also shifting environmental characteristics that may affect the probability of proceeding through the total sequence. Some of these shifting environmental events may be of a very transient quality,

e.g., the unexpected arrival of residents during the course of a burglary, elimination of protective cloud cover and the appearance of a full moon lighting the scene, and so forth.

But there are also a number of stable environmental characteristics that impinge upon the sequential decision-making process. Two such factors involve time of year or season and lighting. Thus, a neighborhood during the summer may be a totally different place in terms of attractiveness to burglars than the same neighborhood in the winter. In the summer, for example, the social climate may be more cohesive as people spend time outdoors, are more sensitive to strangers on the street, etc. On the other hand, many families are on vacation during the summer, children may be at home rather than at school, etc. Or, detectability quality may shift with seasons, as people leave windows open and are more readily able to see and hear others during the summer. On the other hand, doors and windows that are open may change the quality of actual barriers. Symbolic barriers may also be different at different times of the year, e.g., in the summer, foliage and vegetation is thicker, thereby emphasizing the presence of symbolic barriers as well as altering detectability. Although it is not possible to specify how these stable environmental factors impact on the decision-making sequence, we should recognize that ultimately a model of the type proposed here must take such factors into account.

Time of day is another important variable that may alter the decision-making sequence. For example, a home and neighborhood with a strong positive social climate, extensive symbolic barriers, physical traces and high detectability may never be burglarized during the daytime, but may become an inviting target at night, as these factors might lose their significance. In addition, the presence of people in homes may, in some ways, be more evident in the dark, as lighting becomes a more visible cue of occupancy.

In summary, there are a number of factors extrinsic to the decision-making sequence which may play an important role in the rate, nature and course of progress through the hypothesized model.

Future Directions and Needs

The model and classification taxonomy proposed in this paper are only first approximations to understanding the relationship between territoriality and residential crime. Several things now need to be done to explore these ideas further. For example, further conceptual development of the model is necessary. This means that additional work is needed to understand and clarify the decision-making sequence, to develop further the classification system of physical, behavioral and social cues associated with territorial control, and to arrive at a more sophisticated understanding of the interaction of variables in the model, i.e., how they complement, work against and combine with one another. In addition, conceptual analysis is necessary to better understand how the internal and external factors described above operate to alter the flow of events hypothesized by the model.

But more is called for than additional conceptual development. Empirical work needs to be conducted to see how the variety of factors interact, to determine their weightings and to obtain empirical validation of the model. We are presently engaged in a preliminary effort along these lines in cooperation with the Salt Lake County Sheriff's Office. Specifically, we are comparing previously burglarized homes with non-burglarized homes in terms of cues from the classification system described earlier. The following types of homes are presently being examined: burglarized homes, non-burglarized homes on the same street as burglarized homes, non-burglarized homes on streets where no homes have been burglarized. In addition, we plan to compare

day and night characteristics of these homes, as well as winter and summer features. We also hope to assess burglaries conducted by experienced professionals compared to other types of burglars, as well as burglaries differing in the value of stolen items.

Our plan is to undertake multivariate analyses that will enable identification of major individual characteristics and combinative characteristics of streets, sites, and homes that distinguish burglarized and non-burglarized residences. If such factors can be identified, it may then be possible to make inferences about the utility of the decision-making model proposed in this paper, and the relative importance of different variables involved in the process.

What has been proposed in this paper is only an exploratory conceptual framework. Nevertheless, working from a general theoretical framework and then developing a specific conceptual model may be useful to our understanding of the burglary process in relation to territorial behavior.

References

- Altman, I. *Environment and social behavior: Privacy, personal space, territory, and crowding*. Monterey, Calif.: Brooks Cole, 1975.
- Brantingham, P. J., & Brantingham, P. L. A theoretical model of crime site selection. Paper presented at a meeting of the American Society of Criminology, Atlanta, November, 1977.
- Capone, D. L., & Nichols, W. W. Crime and distance: An analysis of offender behavior in space. *Proceedings, Association of American Geographers*, 1975, 7, 45-49.
- Capone, D. L., & Nichols, W. W. Urban structure and criminal mobility. *American Behavioral Science*, 1976, 20(2), 199-213.
- Harries, K. *The geography of crime and justice*. New York: McGraw-Hill, 1974.
- Letkemann, P. *Crime as work*. Englewood Cliffs, N. J.: Prentice Hall, 1973.
- Newman, O. *Defensible space: Crime prevention through urban design*. New York: Macmillan, 1972.
- Rengert, G. Spatial aspects of criminal behavior: A suggested approach. A Paper presented for the Special Session on the Geography of Crime, East Lakes Division, Association of American Geographers, 1972.
- Repetto, T. *Residential crime*. Cambridge, Mass.: Bollinger Publishing Co., 1974.
- Scarr, H. A. Patterns of burglary. (National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice, Law Enforcement Assistance Administration) Washington, D.C.: U.S. Government Printing Office, 1973.
- Shover, N. E. Burglary as an occupation (Doctoral dissertation, University of Illinois at Urbana-Champaign, 1971). *Dissertation Abstracts International*, 1972, 32, 589A-1114A. (University Microfilm No. 71-21,228)

Footnotes

¹There is some research on residential burglary that relates indirectly to aspects of the model presented here, although previous studies of residential burglaries have not focused directly on the relationship between territoriality and burglary. For example, Scarr's study (1973) examined the place and means of entry into residences in order to describe burglaries in terms of the type of barrier provided by a door or window. He also found that corner houses are more susceptible to burglaries than non-corner houses. The fact that more front doors were entered in the Washington, D.C. areas and more rear and side doors were entered in a nearby county may be due to the public-secondary-primary territory qualities of the different places. (Although Scarr's hypothesis that the difference is due to the number of single versus multifamily dwellings is also plausible.)

In another study Reppetto (1974) interviewed burglars about the various factors affecting their burglary decision. His emphasis was on the effect of different degrees of barrier security (alarms, locks, etc.) and how this would affect the burglar's progress. He also revealed that certain types of burglars have differential sensitivities to different types of deterrents to burglary. Although he found out what the burglar's thought about various factors such as "neighbors checking" or "dogs," it is still not clear how burglars determine the degree of presence or absence of these factors or how their influence is felt at each step in the burglary process.

²Of course, another important factor associated with boundary intrusion and burglary involves the potential payoff of success. While the hypothesized sequence of decision-making outline previously is generally expected to relate to the probability of successful intrusion, as judged by a burglar, the variable of payoff also enters into his/her judgment. A low probability success venture

may nevertheless be undertaken because of a very high potential payoff; a venture with a relatively higher probability of successful intrusion may be aborted because of a known low payoff. Thus, adjustments in the probability of burglary may be affected by the value of the potential haul. Furthermore, an indicator of the value or payoff of the venture might be reflected in the number and type of actual and symbolic barriers, i.e., more barriers may suggest there is something worth protecting and thereby worth burglarizing.

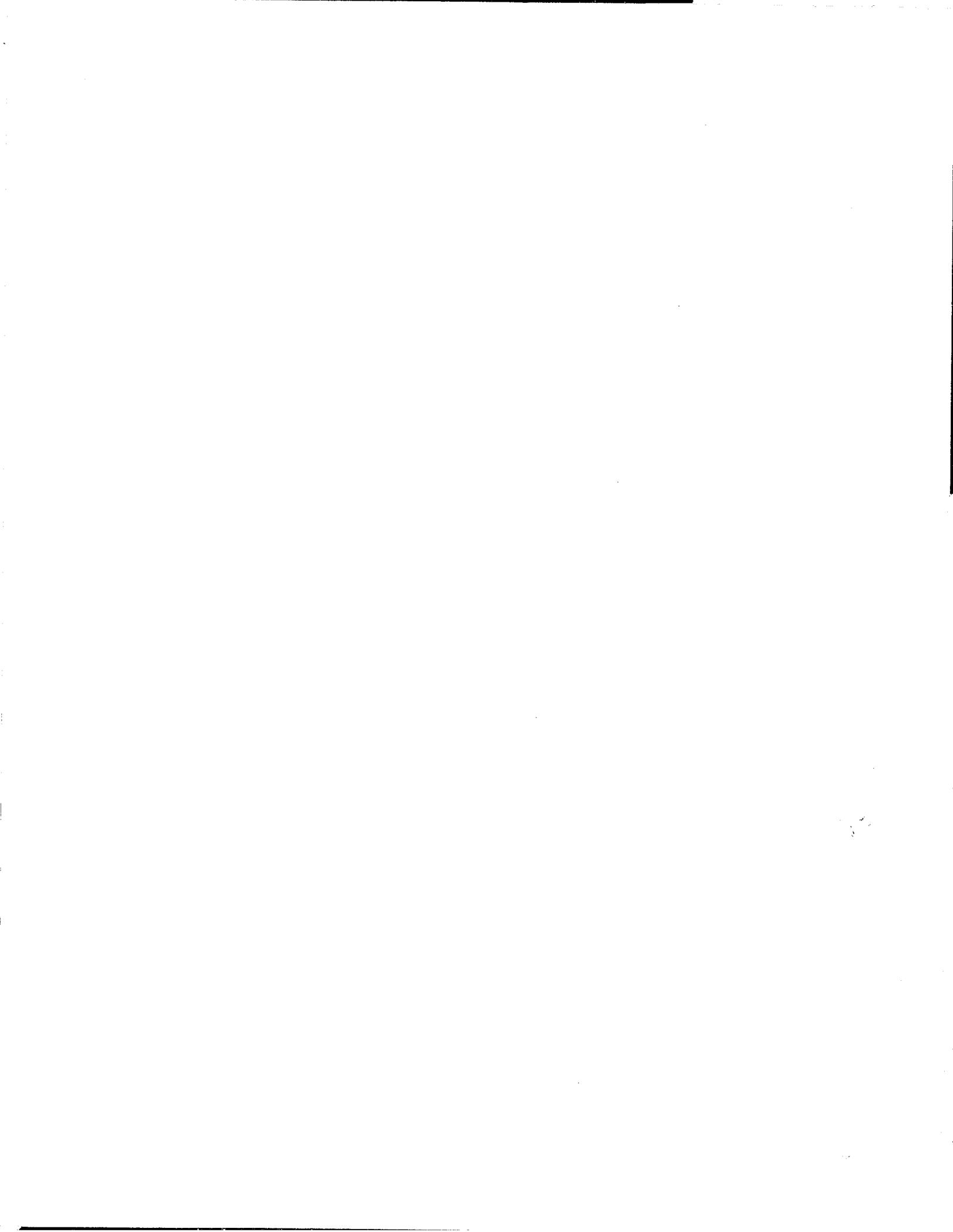


Table 1

Dimensional Variations Between Public, Secondary, and Primary Territories

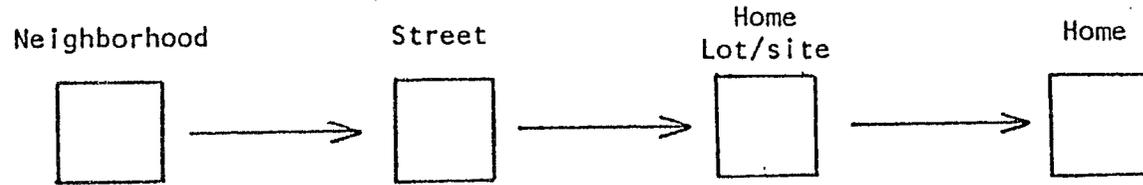
<u>Dimension</u>	<u>Public</u>	<u>Secondary</u>	<u>Primary</u>
Duration	Short	Short, but regular usage common	Long
Centrality	Not Central	Somewhat central	Very central
Marking Intentions	Intentionally claiming territory	Often claiming territory	Usually personalizing or decorating
Marking range	Few physical markers or barriers. Much bodily and verbal marking	Some reliance on physical markers. Bodily and verbal marking common	Heavy reliance on a wide range of markers and barriers. Bodily and verbal marking usually not necessary
Responses to invasion	Can relocate or use immediate bodily and verbal markers	Can often relocate, use immediate bodily and verbal markers, as well as some re-emphasis of physical markers	Cannot relocate easily, can use legal recourse, re-establishment of physical markers and barriers, as well as bodily and verbal markers

Table 2

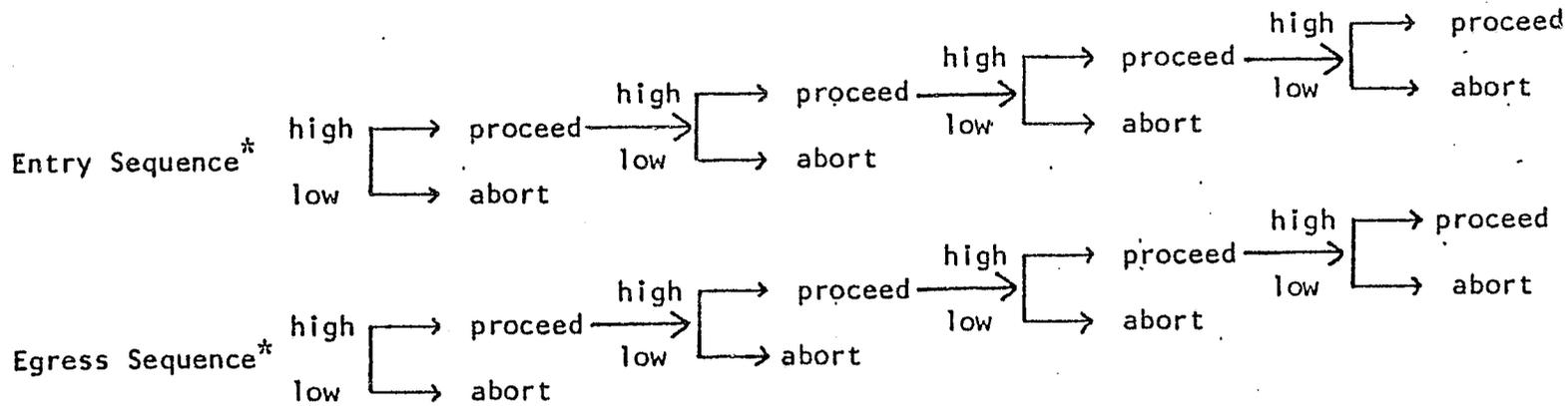
Vulnerability Factors Associated with Street, Site, and House

Factor	Street	Site	House
Detectability	Design: winding vs. narrow Distance: street to house Lighting Window, door positions relative to street Textural composition of road Weather: snow, ice, rain	Shrubs, trees, walls, fences blocking burglar from street or house Burglar seeing into house—door and window position, covering (blinds or curtains) Auditory cues—squeaky gate, dogs barking, sidewalk texture	Target window visibility to neighbors, street Window positioned to see returning occupants once inside General visibility by neighbors or others due to window placement
Actual Barriers	Locked gates, fences, guards	Locked gates, fences, guards Is opening large enough to carry away goods?	Locks on windows, door—degree of difficulty or time to open Alarm system Is opening large enough to carry away goods?
Symbolic Barriers	Welcome signs Neighborhood Assoc. Signs Distinctive cultivation for streets	Distinctive personalizing items in yard—mail boxes, lampposts, welcome mats, signs, flower garden Marking of entryway from the public street (sidewalks, raised or lowered elevation, paths)	Nameplate, coat of arms on door Signs on door (no solicitors Neighborhood Watch) Distinctive coloring or material of house
Traces	Cars parked on street Mail, newspapers in box or on street	Equipment indicating interrupted activity: lawn mower, rake, children's toys Sprinklers (working) Appropriateness of lighting Uncollected deliveries Ringing telephone	Hearing TV's, radios, voices, telephones Lights Cooking odors
Social Climate	Reactions by others—staring, questioning, ignoring, looking	Reactions by others—staring, questioning, ignoring, looking	Reactions by others—staring, questioning, ignoring, looking

BOUNDARY AREAS:



ACCESSIBILITY OR INTRUSION POSSIBILITIES:



* Entry and egress possibilities are judged during the entry process; either low access or low egress will abort the intrusion.

Figure 1. A conceptual model of territorial intrusion/burglary of residential dwelling.



Crime Prevention through Environmental Design in the Urban Shopping District

John E. Conklin

Tufts University

Dramatic increases in crime rates beginning in the mid-1960's led to widespread fear of victimization and concern with crime as a political issue. Fear of victimization produced costs beyond such direct losses as stolen property and personal injury. One indirect cost of crime was the adoption of avoidance techniques designed to minimize personal risk; such measures included staying indoors after dark, avoiding strangers, keeping windows and doors locked, staying away from certain areas of the city, and using cars to travel through the city (Furstenberg, 1972). Businesses in urban shopping districts adopted such avoidance techniques as closing earlier and opening doors only to people known to the proprietors. Such measures probably contributed to the decline of the urban shopping district as people sought other places to shop. In addition to these avoidance techniques, people also employed mobilization measures such as firearms, watchdogs and burglar alarms to increase their personal safety; such measures cost money and erected barriers between people.

The President's Commission on Law Enforcement and Administration of Justice (1967: 88) concluded that "the fear of violence is not a simple fear of injury or death or even of all crimes of violence, but, at bottom, a fear of strangers." Fear of crime and fear of strangers have drastically altered the behavior of citizens, especially those who live in high-crime urban areas. Residents of neighborhoods with relatively low crime rates have also changed their behavior to avoid situations which they see as risk-filled. Survey research on avoidance behavior regularly finds that people are afraid to walk the streets of their own

neighborhoods and often see other neighborhoods as even more dangerous. However, as we shall see below, many factors other than fear of crime influence the level of human traffic on the streets of a community.

A general model which has evolved in recent years proposes that high crime rates lead to a fear of crime which elicits changes in behavior that it turn increase the crime problem (for elaboration, see Conklin, 1975). Fear of victimization empties the streets of people and thus reduces the informal control of behavior in public places. This model assumes that the presence of people will deter potential criminals who feel that onlookers will personally intervene or call the police. This will lead some "marginally committed" offenders to give up the idea of crime altogether (deterrence); other criminals will seek alternative targets (displacement).

The idea that crime will increase in the absence of strong informal social controls in public places was first systematically discussed in Jane Jacobs' innovative book, The Death and Life of Great American Cities (1961). She proposed that a network of voluntary controls, the "eyes of the natural proprietors" of the streets, helped to enforce community standards and reduce crime in the streets. She argued that streets are safest when they are in fairly continuous use, since this provides "eyes" on the street which control the behavior of potential deviants. This idea has been elaborated upon by Angel (1968), who claims that crime occurs in "critical intensity zones" where there are potential victims on the street but insufficient human traffic to provide surveillance and informal social control. In a similar vein, Suttles (1968) speaks of "impersonal domains" in large cities, nonresidential areas which experience periodic anomie. In such areas during the daytime the safety of passersby rests with local businessmen, bureaucrats, customers, and police officers. However, these impersonal domains become deserted at night as they are abandoned by all but an occasional police officer. The lack of street life,

the darkness of the areas, and the absence of places to go give people no reason to be in those areas, contributing to a fear of victimization which reinforces the desertion of the areas.

Similar ideas have been developed with reference to the built environment. Oscar Newman (1972) speaks of "defensible space" and proposes that architectural design in public housing can create a sense of territoriality among residents which will enhance the informal control of behavior and reduce crime in such places. The relationship between crime and physical environment has been examined in detail by the Crime Prevention through Environmental Design (CPTED) program developed by the Westinghouse Consortium under contract to the Law Enforcement Assistance Administration. The goal of the CPTED program is the reduction of "common, predatory, generally stranger-to-stranger 'crimes of opportunity'" (Kaplan et al., 1977: 1-2). The strategy is to affect the "natural and routine use of space" (Rouse et al., 1976: xv) by altering the design of the environment through combining various anti-crime resources which will discourage criminals from opportunistic crime and which will prevent the development of the motivation to commit crime in the first place.

One of the three demonstration projects developed by the CPTED program is the alteration of the environment of a commercial strip in Portland, Oregon. The specific goals of this project are to provide greater security for residents of the area, to reduce the deterioration of the area, to provide better street surveillance, and to secure parking and transit stops. To meet these goals, a variety of strategies have been developed to attract more shoppers to the area (see Kaplan et al., 1977: Chapter 3). These strategies involve more visible police patrols, better lighting, the elimination of vacant lots, and the enhancement of perceived personal security. The CPTED model suggests that the image of an area as safe or dangerous is an important consideration in the making of decisions

about where to shop. An area's image is dependent on a variety of factors, including:

1. Physical aspects of the area: People may associate danger with such areal characteristics as dirt, litter, abandoned spaces, poor lighting, disrepair of buildings, noise, dark alleys, or low "imageability" of physical design.
2. Social characteristics of area residents: People may associate danger with the social, ethnic, and economic characteristics of the people who live in an area or who frequent the streets of an area (e.g., winos, teenagers, addicts, loiterers, or prostitutes).
3. Social relations within the area: People may associate danger with the absence of human traffic on the streets of a community, the lack of social cohesion among community residents, or the presence of too much social cohesion among community residents which makes strangers feel like intruders.
4. Formal security forces in the area: People may associate danger with the absence of the police (public or private) or with difficulty of access to the police in an area.

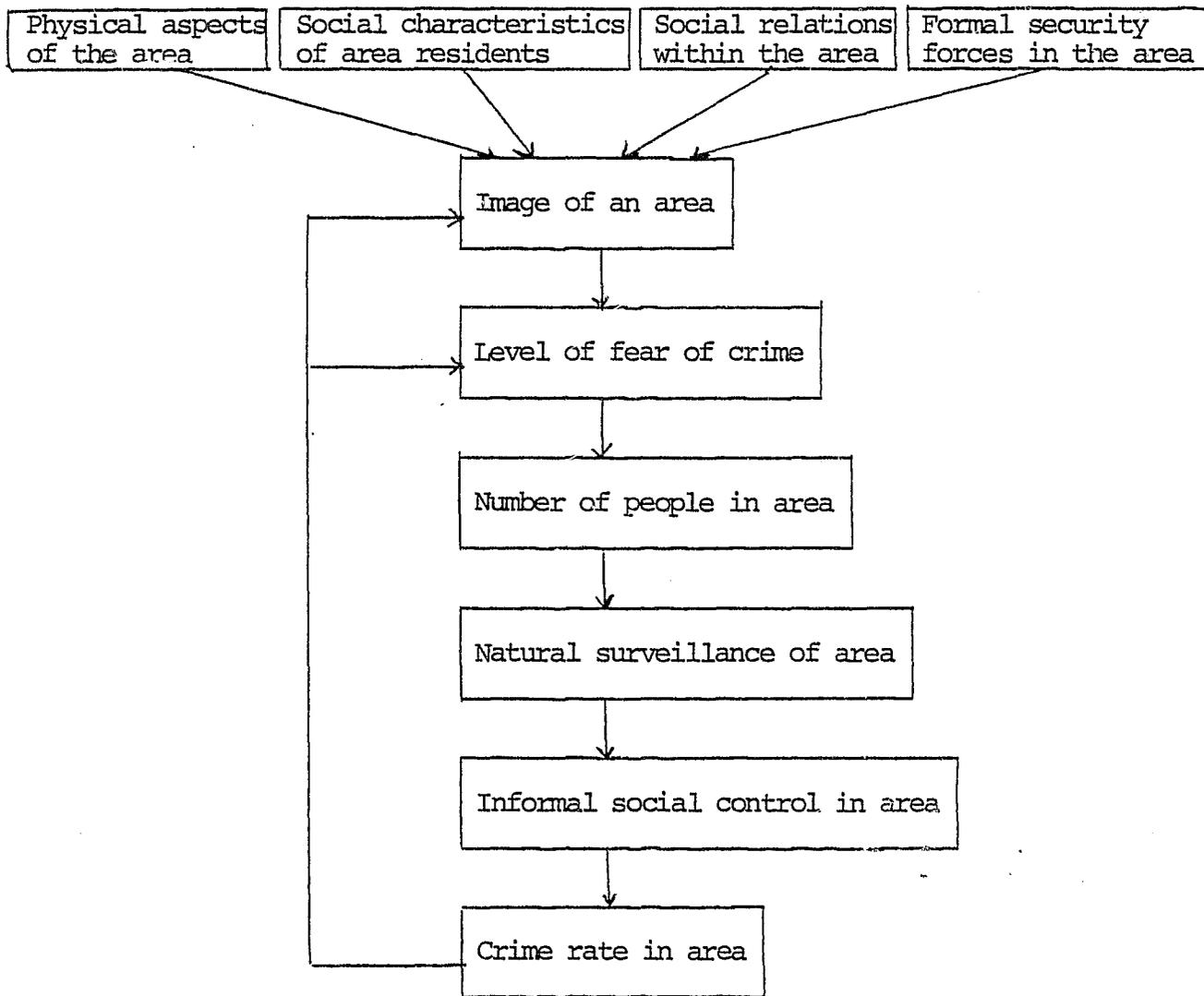
The CPTED model assumes that crime will be reduced if people are attracted to the streets of an area. These people will provide informal social control and deter (or displace) crime. The importance of attracting people to the streets of commercial districts was recognized by Jacobs in 1961. She stated that an area needs stores and public places which are in use by day and by night in order to attract people; bars, restaurants and stores give people reasons to go out and also lead residents of an area who stay indoors to watch the people on the streets. The viability of a downtown area is a function of the diversity of uses to which

the area is put (Jacobs, 1961: 143-177). For an area to attract human traffic, it must serve multiple primary needs (e.g., work, residence, shopping, entertainment, education, and recreation); these primary functions must be integrated within one area. For instance, the off-duty needs of workers should be met by other establishments in the area where they work, e.g., there should be restaurants where they can get lunch or dinner and shops which will attract them during their lunch hour or before they go home after work. Ideally, human traffic will be distributed throughout the day, with people who are on different schedules being drawn to the area. Such diversified use of an area will minimize the development or maintenance of specialized activity areas which divide cities, reduce citizen surveillance of the streets, and increase opportunities for crime. Such diversity is most likely in an area with a dense concentration of people who either live in or are pulled to the area; in other words, an "effective economic pool of use" is necessary to sustain diversity in an urban community.

Jacobs' ideas have influenced urban planners. To take just one example, Redstone (1976: xv) claims that a viable city needs "a continuous day and night activity in a secure, relaxed and socially conducive atmosphere." He views security as the stumbling block in keeping people in the city and bringing others back to the city. He asserts a need for areas of mixed uses, e.g., housing, business, and special events; he also advises that cities should use their cultural, recreational and educational facilities to draw suburban residents to the city.

Such ideas form the theoretical basis for the CPTED model of crime reduction in the commercial district. This model may be roughly outlined as follows:

Figure 1. The CPTED Model of Crime Reduction in the Urban Shopping District



CPTED strategies are generally designed to reduce crime by affecting the components of an area's image; in other words, CPTED tries to alter the physical aspects of an area and the formal security forces within the area (and in a less direct fashion, the social relations within an area) so that the image of an area will change in a way to reduce fear of crime, attract more people, and thus pro-

vide more surveillance of the area and more informal control over potential criminals. By reducing crime, a self-reinforcing cycle will be set in motion so that the image of an area and the fear of crime in the area will be further reduced by the effects produced by the initial impact of the CPTED strategies.

CPTED strategies seek to affect the "natural behavior" of people by altering the urban environment. The model thus includes a set of implicit assumptions about what constitutes "natural behavior." It assumes, inter alia, that people decide where to shop in part on the basis of the perceived risk of criminal victimization in the area near a store. This paper will examine shopper motivation (why people shop) and shopper mobility (how people decide where to shop). Both issues are critical to the success of a CPTED program which seeks to reduce crime in a commercial district by drawing more people to that area. Knowing why people shop and how they choose where to shop will suggest what type of design of an urban shopping environment is needed to keep urban residents in the district and attract suburban residents to the district.

The Shopping Experience

Marketing research has commonly focused on the buying experience, the way in which consumers evaluate and differentiate between products. There is considerably less work on the shopping experience itself, the motives for shopping and the selection of one shopping locale over another. The common assumption is that people shop in order to make a purchase, that they shop to fulfill a self-defined need for a good or service which has utility for them. However, common experience and impressionistic research evidence suggest that shopping fulfills a variety of personal and social needs which are only marginally related to the actual purchase of goods and services.

Shopper motivation. An early effort to determine the motives for shopping was a study by Gregory Stone (1954) of adult women who lived within one Chicago business district. He discovered that the women viewed market relations in different ways, and quite often not in the impersonal way which urban sociologists have often attributed to commercial transactions in the city. Stone isolated four types of consumers. The economic consumer (33 percent of the sample of 124 shoppers) was sensitive to price, quality and selection of merchandise and was concerned with the efficiency of sales personnel; she shopped with the purchase of goods foremost in her mind. A second type was the personalizing consumer (28 percent), who shopped where she was known by name and who was personally attached to store personnel; for her, shopping was "fundamentally and positively interpersonal" (Stone, 1954: 38). The personalizing consumer was less interested in price, quality and selection than in the friendliness of store personnel and the opportunity to be treated as a human being while shopping. The third type was the ethical consumer (18 percent) who shopped where she felt she "should" shop; she avoided large, "heartless" chain stores in order to "help the little guy." She felt a moral obligation to patronize certain stores and to avoid others; economic and interpersonal factors were relatively unimportant. The fourth type was the apathetic consumer (17 percent). She shopped because it was a necessity and sought convenience rather than low price or high quality and rather than personal relations with store personnel. She considered shopping an unpleasant duty which should be completed as quickly and easily as possible. Another 4 percent of the shoppers could not be categorized.

A more recent study also suggests that the motives of shoppers are considerably more complex than the simple fulfillment of an economic need for a good or service. In a 1972 paper Edward Tauber asked the simple question, "Why do people shop?" He questioned a nonrandom group of 30 people about their most recent

shopping excursions, their activities during those trips, and what they enjoyed about their shopping experiences. Tauber developed from their responses a list of motives for shopping, although he did not assign any priority to those motives.

Personal motives for shopping included:

1. Role-playing: Shopping itself may be a form of socially expected (normative) behavior, e.g., grocery shopping by a housewife.
2. Diversion: Shopping, especially "browsing", may be a form of recreation or free entertainment for individuals and families.
3. Self-gratification: The buying process itself may be fulfilling, e.g., buying a hat to alleviate depression.
4. Learning about new trends: Shopping allows people to keep up with the latest styles and to see new items and decorating ideas.
5. Physical activity: Shopping may be a form of exercise, especially for urban residents who hold desk jobs.
6. Sensory stimulation: Shopping allows people to look at products, handle goods, and "people watch"; sounds and scents form part of an often unconscious gestalt of the shopping experience.

In addition to these personal motives, Tauber lists five social motives for shopping:

7. Social experiences outside the home: Stores may act as gathering places (e.g., the local teenage "hangout") or as places to see friends.
8. Communication with others who have similar interests: Certain stores cater to those with specific interests and may become gathering places for aficionados of comic books, stamps, coins, records, or books.
9. Peer group attraction: Some stores may attract members of one's reference groups (e.g., a specialized book store).

10. Status and authority: The experience of being waited on and being served by an employee may be gratifying, at the same time that it does not obligate the shopper to buy anything.
11. The pleasure of bargaining: Some shoppers may enjoy the bargaining process (e.g., in antique shops or used book stores) or may enjoy finding a "steal" at a sale.

Tauber concluded that people shop for many reasons other than to fulfill a narrowly defined need for a good or service; they shop to get attention, to be with others, and to have something to do with their leisure time. Stone's and Tauber's studies provide support for a strategy of altering the downtown shopping district in a way to fulfill noneconomic, personal and social needs of shoppers. Suburban shopping centers have probably been more successful than downtown shopping districts in fulfilling such needs until now; according to one large-scale developer of suburban shopping centers, "shopping is just one part of the total family experience...people always use shopping as an outlet, as a means of getting away from the home, as a change of scenery" (cited in Hansell, 1977: 7). Urban planners need to adopt and implement such views in the development of downtown shopping districts.

Shopper mobility. Related to the motives for shopping are those factors which determine where people will shop. The CPTED model suggests that choice of shopping locale will be in part a function of the fear of crime. In more general terms, such a choice may be seen as a response to environmental stress. Lee (1966) suggests that an individual's behavior is based on his attitude toward the external environment. The individual assesses the environment in terms of a standard of acceptability which he has learned during childhood, from later experiences, and in direct training as an adult. One response to

environmental stress is avoidance, a response which may prove costly to an individual and to society in the long run even as it protects the individual in the short run. A shopper's decision to shop in one area rather than another may be an avoidance response to environmental stress which is tied to his fear of crime in a particular area.

Where people shop will also be a function of the way in which they perceive the urban environment as a whole. Lynch (1960) has defined the clarity or legibility of a cityscape as the ease with which its parts can be recognized and organized into a coherent pattern or gestalt by people. He suggests that people find their way throughout a city by holding in their minds generalized images of the exterior physical world; these images are used to interpret information and to guide action. People simplify urban structure in their minds through selective impressions and through the organization of environmental clues; they use both immediate sensations and past experiences to find their way through the city (de Jonge, 1972).

Lynch claims that a good environmental image will enhance emotional security and heighten the intensity of human experience in an urban environment. Although he suggests that the "imageability" of a city is a function of a variety of factors — including physical objects, the social meaning of areas, the functions of areas, the history of areas, and even the names of areas — his analysis focuses on the way in which images of a city are related to physical, perceptible objects in the urban environment. After having people draw maps of cities upon which they identified salient objects, Lynch concluded that a city's image was comprised of five elements: paths, edges, districts, nodes, and landmarks.

Since Lynch's analysis of the cognitive maps people hold of cities, there have been a number of additional studies of cognitive mapping of geographical

areas (for example, see Milgram, 1970; Ladd, 1970; de Jonge, 1972; Downs and Stea, 1973, 1977; Gould and White, 1974; and Kohn, Franck and Fox, 1975). A study of public reactions to crime by a group at Northwestern University (Reactions to Crime, 1976) measured the boundaries of areas where people felt safe and unsafe in order to learn their sources of information about areas of the city and in order to understand why people perceived various areas of the city as they did. In another study, people were asked to construct maps of areas of a city "as they are now" and "as they should be"; the role of fear of crime in the cognitive mapping of the city was examined in that study (Rau, 1975). The use of such cognitive maps in the making of decisions about where to shop is largely unexamined, although some beginning efforts to study that relationship have been made (for example, see Mazze, 1974).

In large metropolitan areas, which are of particular interest to the CPTED program because of the high crime rates of central cities, shopping patterns may in part be described as follows: many suburban residents shop in suburban shopping centers (even if they work in the city) and some urban residents travel to outlying areas to shop rather than shop in an urban environment which they see as dangerous. Downtown merchants thus lose some indeterminate amount of business to suburban shopping centers both because of the absence of "in-shopping" by suburban residents and the presence of "out-shopping" by urban residents.

Studies of the phenomenon of out-shopping — the out-migration of shoppers who live within a given retail area — have for the most part focused on the residents of one small town who travel to nearby towns or cities to shop, rather than on the mobility of shoppers within large metropolitan areas. Still, these studies do provide some evidence about the motivations of shoppers who travel some distance to shop.

A recent review of research on shopper mobility found that there is a maximum amount of time and mileage which consumers will invest in travel in order to purchase particular products; the amount will vary with the product which is sought, e.g., people may be willing to travel further to buy clothes than to buy food (Mazze, 1974: 43). Consumers generally purchase goods and services at the closest place which offers those goods and services, and they prefer to combine the purchase of a number of items into one shopping trip. These general conclusions suggest that to attract shoppers to downtown areas from the suburbs it may be necessary to provide "a little bit extra"; this may be a shopping experience which fulfills a variety of personal and social needs or it may be a greater diversity of goods and services than is provided in suburban shopping centers. To know what will attract shoppers to the city, it is necessary to understand how people select a place to shop.

A study of out-shopping which questioned members of 422 households in State College, Pennsylvania (a town of 27,000) found that out-shopping was least common among lower-income groups, among families with younger children, and among families with larger numbers of children (Herrmann and Beik, 1968). The primary motive for out-shopping was a desire for access to a larger and more varied selection of clothing; concern with better prices was comparatively unimportant as a motive. This study concluded that higher-income shoppers were willing to incur considerable expense and inconvenience to gain access to a better selection of fashion merchandise in larger urban centers.

A study of out-shopping in a nonmetropolitan area of Georgia found that the major reasons for traveling from one small town to other communities were the feeling that local stores carried too small a selection (this reason being given by 58 percent of the sample), the desire to see what was available elsewhere (41 percent), the feeling that local prices were out of line with prices else-

where (40 percent), and the sense that local stores tried to sell merchandise which was old or of poor quality (24 percent) (Thompson, 1971). No other reason was given by as many as 20 percent of the out-shoppers. Other reasons given by out-shoppers for their choice of more distant shopping locales included parking problems (17 percent), inconvenient store hours (15 percent), unpleasant store appearance (13 percent), lack of knowledge among local clerks (11 percent), discourtesy by local clerks (11 percent), poor public transportation (9 percent), and restrictions on credit (8 percent). We must beware of extrapolating from this study of a nonmetropolitan region to large urban areas. It is certainly possible that store location (including the crime rate in the neighborhood of the store), store appearance, store hours, parking problems, and public transportation are more important in determining shopper mobility within large metropolitan regions than they are in regions such as the one where this study was done. Nevertheless, this study does suggest that price, selection and quality of merchandise are primary reasons for shopper mobility.

Another study in a nonmetropolitan region (the southwestern part of Virginia) looked at a variety of attitudinal (as well as socioeconomic and informational) determinants of out-shopping (Samli and Uhr, 1974). The authors concluded that out-shopping was significantly related to the following: the quality of goods, the selection of goods, the price of goods, the courtesy of salespeople, the product knowledge of salespeople, ease of shopping within the store, ease of access to downtown, the appearance of the store, and the store's hours of operation. Three factors which did not distinguish out-shoppers from others were ease of parking, other services offered by retailers, and credit arrangements. This study again indicates that the products available in an area influence shopping patterns, and also that store personnel affect decisions as to where to shop. Store hours and ease of access to the store were important factors in the decision

about where to shop, but crime as a specific aspect of the local environment did not emerge as a cause of shopper mobility. However, the subjects in this study were not specifically asked about fear of criminal victimization and the study was done in a nonmetropolitan region where fear of victimization may well have been below the threshold necessary to affect social behavior (see Conklin, 1975: 84-85).

Another study which bears more directly on the issue of choice of shopping locale was also done in a small community rather than in a large metropolitan region, but this study asked subjects to choose among four department stores as to personal preference for shopping (Bearden, 1977). Since some of the stores were in town and others were on the outskirts of the community of 35,000 people, the researcher was able to draw conclusions about patronage choices between downtown stores and their competitors in outlying shopping centers. Interviews with a nonrandom group of 95 female clerical and staff workers in a large regional state university led the author to conclude that choice of shopping locale was not related to differences in price levels, quality of merchandise, or selection of goods. None of these reasons was given by those who traveled to the outskirts to shop. Bearden did find that the general atmosphere of the store and the location of the store were important factors in store selection. The presence or absence of parking facilities and the friendliness of store personnel were even more important determinants of where a person shopped. This study provides additional empirical evidence, again from a nonmetropolitan region, of the factors influencing shopper mobility. The importance of store location is supported by this study, although the question of whether fear of criminal victimization in the neighborhood of the store affects shopper mobility is left unanswered.

In addition to studies of the general phenomenon of out-shopper behavior and its determinants, there have been a number of studies which have examined why

people shop in suburban shopping centers. Whereas studies of out-shopper behavior may cast light on the problem of why urban residents leave the city to shop, studies of the reasons for patronage of suburban shopping centers are relevant to the other side of the problem of revitalizing downtown shopping districts, the absence of in-migration of suburban shoppers to the city. CPTED strategies must expand downtown shopping both by residents of the city and by residents of the surrounding suburbs. Knowing what makes suburban shopping centers attractive to consumers may suggest ways to develop competing shopping districts in the city.

There is some evidence that the development of downtown shopping centers is beginning to reverse the trend toward suburban shopping centers which began just after World War II. Reasons to expect such a shift include the diminishing number of good regional mall sites in the suburbs, the energy crisis and the attendant shift to mass transportation, a lower birth rate and the related decline in the rate of suburban growth, a slowdown in highway construction, and reduction in the development of large subdivisions of single-family homes in the suburbs (Yudis, 1977: C1; Yudis, 1978: F5). These trends suggest that CPTED strategies may be reinforced by other social changes in a way to bring shoppers into the city, increase human traffic on the streets, enhance informal social control in public places, and thus reduce crime.

One factor which influences shopper mobility is driving time. Studies have established that driving time helps to determine which of a number of regional shopping centers a customer will patronize; the need to travel more than 15 minutes reduces the motivation to shop in a suburban shopping center (Brunner and Mason, 1968). Although driving time is an important consideration, the location and attractiveness of shopping centers is also important in the shopper's choice among regional shopping centers (Cox and Cooke, 1970). This implies that customers might be willing to exceed the 15-minute drive in order

reach a "better" shopping center. What constitutes "better" has been the subject of some research and has implications for the design of urban shopping districts.

A study of 420 customers of one shopping center found that the following factors, listed in order of importance, influenced patronage of shopping centers (Jolson and Spath, 1973):

1. Price/value relationship
2. Store specialization
3. Quality of merchandise
4. Salesclerk service (availability, competence, congeniality, etc.)
5. Store location
6. Variety and assortment
7. Guarantee, exchange and adjustment policies
8. Customer habit or routine
9. Legitimacy of sales
10. Other convenience factors (delivery, parking, store hours, etc.)
11. Credit and billing policies
12. Store layout and atmosphere
13. Merchandise displays
14. Suitability of advertising

This study does not explicitly compare suburban shopping centers with downtown shopping districts as alternatives to each other, but it does indicate some of the factors which influence where people decide to shop. Store location ranked fifth among the factors. Although location involves a number of components, fear of victimization in the neighborhood of the store may be one of those components.

A recent study of the motives for patronage of shopping centers questioned

261 relatively affluent women in Atlanta, Georgia (Bellenger et al., 1977). A factor analysis of the responses concluded that the most important dimensions influencing the selection of a particular shopping center were the following, listed in order of significance:

1. Quality of the center. This included good security, attractiveness of decor, courtesy of personnel, high quality of merchandise, cleanliness, and pleasant atmosphere. Of lesser importance was the availability of parking.
2. Convenience (economic). This included convenience to home and ease of accessibility. Of lesser importance were convenient store hours, low prices, and convenience to work.
3. Variety under one roof. This included an enclosed mall, the variety of stores, the number of large department stores, and the presence of new fashions.
4. Presence of related services. This included the presence of banks, restaurants, and movie theatres. Of lesser importance was having friends who shopped in the same center.

A significant finding here is the importance of providing good security for shoppers. This has important implications for the development of urban shopping districts where the overall level of personal security is apt to be much lower than it is in suburban shopping centers. This study also found evidence of two distinct types of shoppers which had to be considered in the planning of shopping centers: convenience shoppers who were concerned with location, accessibility, parking, and a minimum of walking; and recreational shoppers who were concerned with quality, variety under one roof, and related services.

Only a few scattered studies in the marketing research literature have focused on the shopping experience and the needs which shopping fulfills in addition to the economic need for a good or service. Knowing about shopping behavior is critical for the effective design of an urban shopping environment, since out-shopping can be reduced and in-shopping increased by catering to personal and social motives for shopping. Because most research on shopper mobility has been carried out in nonmetropolitan regions, research is needed on the determinants of intraurban shopping patterns and the role which fear of victimization plays in the making of decisions about where to shop.

Some indirect evidence about intraurban shopping patterns comes from interviews with a sample of businessmen on the commercial strip in Portland, Oregon, where the CPTED program was implemented. Businessmen did not agree as to whether fear of crime affected shopping behavior in the area: 40 percent felt that at least some customers had limited their use of the commercial strip because of their fear of crime, but 31 percent thought that hardly anyone had stopped coming to stores in the area because of their fear of crime (Lavrakas et al., 1978: 42). Businessmen identified a series of factors which they felt might have reduced customer patronage of stores on the commercial strip: 45 percent felt that the general physical appearance of the area kept customers away, 27 percent thought that the lack of parking facilities reduced patronage of the stores, 17 percent said that local traffic patterns kept shoppers away, and 15 percent admitted that the physical appearance of their own store might have reduced business (Lavrakas et al., 1978: 22). Another set of interviews asked key persons in the community, including business and community leaders and patrol officers, about the shopping behavior of local residents. These key persons agreed that people who shopped on the commercial strip did so because of proximity to the stores rather than because they were attracted to the stores for

quality or economy (Lavrakas et al., 1978: 22). These impressions of local businessmen and of key persons in the community are only interpretations of the determinants of shoppers' behavior; such impressions are less useful than direct evidence about why people shop and how they choose where to shop, but the impressions do suggest some possible influences on intraurban shopping patterns.

The Shopping Experience and CPTED Strategies

The CPTED model assumes that alteration in the four determinants of an area's image will set in motion a series of changes which will reduce crime in the area; one of the changes is the attraction of people to the area. In the absence of detailed data on shopper behavior, it is uncertain whether changes in an area's image will indeed draw shoppers to the area. However, we can speculate on the implications of existing research on shopper behavior for proposed CPTED strategies.

People clearly shop for reasons other than the purchase of a good or service which has utility for them. It would be interesting to know how many shopping trips do not culminate in any purchase at all and how many lead to a purchase which was not intended when the trip was undertaken. Studies by Stone and by Tauber suggest that urban shopping districts can be designed to fulfill needs other than the purchase of goods and services. A well-designed shopping environment will fulfill social and recreational needs, and perhaps even convert some people to shopping as a form of social and recreational activity. For example, the Quincy Market area of Boston draws people from the city and from the suburbs (as well as tourists) who go there "for fun"; buying something is often secondary to the fulfillment of other needs such as "people watching", exercise, or entertainment. Still, many businesses there flourish and human traffic is heavy. The

effect on crime rates in the area is unknown, but most Boston residents feel that Quincy Market is a safe place to go, even after dark. Also, the success of the area in drawing shoppers may have had a more generalized effect in leading both urban and suburban residents to view Boston as a more vital and more interesting city in which to spend time. This may have reduced out-shopping and increased in-shopping.

The shopping experience provided by an urban shopping district can fulfill a variety of personal and social needs. Furniture stores can provide shoppers with information about new decorating trends. Clothing shops also provide information about the latest fashions; this could be reinforced with occasional fashion shows. Specialized hobby shops may also draw a significant clientele. One comic book store in Cambridge acts as a center of communication for an extensive network of collectors in the Boston area. Stamp and coin shops may serve similar functions, especially if they provide programs designed to stimulate interaction among collectors; these programs could stimulate sales at the same time. Bookstores might also foster interaction among customers. One large bookstore in Boston has featured Saturday puppet shows in the children's book section, drawing both children and adults into the store and increasing sales as well as fulfilling shopper's recreational needs. Book discussion groups or even a snack bar in such stores might foster interaction among strangers and break down barriers of distrust which both result from and cause the urban crime problem. Such groups might be viewed by the large and growing number of single adults as a more natural way to meet people than are the singles' bars. What is needed in the city are stores which stimulate the type of informal interaction found in some slum businesses which are locally owned and locally patronized and viewed by community residents as social centers as much as commercial outlets (Suttles, 1968: 83-88).

Research on the shopping experience also indicates that urban shopping

districts will gain from a diversity of businesses which cater to customers who are searching for various satisfactions from shopping. Urban shopping districts can take advantage of the dense population in the center of town; a critical mass of people exists in the center of the city to support specialized stores which could not be supported in a suburban shopping center. For example, the Harvard Square area of Cambridge has nearly twenty bookstores, including one catering to Roman Catholics, one catering to those with an interest in the occult, and another catering to those with an interest in science fiction. Urban shopping districts might well establish a position for a director or coordinator who determines what types of stores will have a sufficient number of customers to be financially viable; such a planner could prevent high turnover because of excessive competition and could provide investors with new ideas. A diversity of shopping opportunities will provide both a more interesting visual experience for shoppers and a greater selection of merchandise (a major reason for out-shopping in nonmetropolitan areas). This will draw shoppers in a way analogous to the way in which educational parks act as magnet schools to pull suburban students into attractive urban schools which offer a diversity of programs.

The ability to draw shoppers is in part a function of the item for which people are shopping. Shoppers will prefer to shop at the closest available outlet for such items as food or notions such as lightbulbs and toothpaste. However, a better price or a better selection of some such items may lead shoppers to travel to more distant stores. For example, the Haymarket Square area of Boston has long thrived as an outlet for the sale of a good selection of fresh food at relatively low prices. Shoppers may also travel some distance if novel items are available. Quincy Market has a large number of food shops which specialize in food which is not easily available elsewhere, e.g., rare spices or baklava. Some of these considerations about the selection and price of merchandise

were important in the initiation of the Sunday Market in the Portland, Oregon, commercial strip CPTED demonstration project (Bell et al., 1976: 69; Lavrakas et al., 1978: 17, 55). This market sought to bring outsiders to the area and thus enlarge the economic pool in the area while also avoiding duplication of the functions served by nearby, solvent commercial districts. This required a differentiation of function, a specialization in the goods and services provided by the Sunday Market. To date, this market concept has only been tried once in Portland, and it attracted over 500 people (Lavrakas et al., 1978: 17, 55).

The many motives for shopping provide a number of clues for designing a shopping district which will draw customers. Reduction of out-shopping and augmentation of in-shopping can be achieved by fulfilling social and recreational needs, by providing a diversity of goods and services, and by concentrating a variety of shops in a single attractive environment. An additional problem which needs to be resolved is that many potential shoppers live some distance from the center of the city, and research shows that driving time is a major determinant of choice of shopping locale. A possible solution to the obstacle of driving time is the improvement of mass transit facilities in the metropolitan area. Better transportation will increase downtown business, strengthen ties among diverse areas within the metropolitan region, permit vulnerable groups such as the elderly to avoid street exposure while shopping, and increase the number of eyes on the street (Bell et al., 1976: 78-85). A Westinghouse report on the Portland commercial strip project suggested that such goals might be achieved through demand-responsive bus service for the elderly and the handicapped, shuttle buses within the city, a fareless corridor within the city, expanded bus service, and safe waiting areas (Bell et al., 1976: 78-85).

Whether or not such changes would increase in-shopping in a major way is uncertain. A newspaper report of a new urban shopping mall in Portland (not

the same area as the one where the CPTED project was implemented) found that only 22 percent of the shoppers who came to the downtown mall used buses; however, the article failed to say where these shoppers came from (Ledbetter, 1977: 18). Still, the planners of the mall said that the proportion of shoppers using buses had to double within three years if the commercial growth of the area was to be handled efficiently. However, there may be a natural limit to the number of shoppers who will come downtown from the suburbs by mass transit. People may feel that it is too inconvenient to wait for a bus, especially since doing so is contrary to a long-standing habit of driving where they want when they want. They may dislike the inflexibility of mass transit; traveling by car allows for spontaneous stops and diversionary side-trips. People may also feel that they spend a lot of money to own, operate and insure a car, and that they should have full use of that car and the convenience which it provides. Thus a better CPTED strategy might provide regular and inexpensive mass transit, but supplement it with improved highways into the downtown area and with easily accessible parking facilities close to the commercial district. To effectively compete with suburban shopping centers, parking may need to be subsidized or free; having to pay a few dollars for parking in order to shop in a downtown store or to attend a downtown movie theatre may prevent trips to the city, especially if similar goods and services are available in nearby suburban shopping centers. Reliance on improved roads and better parking facilities conflicts with federal and state programs to reduce environmental pollution and deal with the energy crisis by reducing the use of cars within metropolitan regions, but it is quite possible that large-scale reliance on mass transit may do little to increase in-shopping by suburban residents. The critical question is exactly how much inconvenience people will accept in order to shop in a more distant urban shopping district which provides a diversity of shops and a wide variety of merchandise.

A factor related to the shopping experience which should not be overlooked in the development of attractive downtown shopping environments is the role of sales personnel. The supply of a plentiful selection of quality merchandise at reasonable prices is important, but studies have also found that courteous and knowledgeable salespeople are important in the shopper's choice of a place to shop. Because of the high volume of transactions in downtown stores, customer-clerk relationships may be brief and impersonal in comparison to customer-clerk relationships in suburban stores. Efforts to make such relationships as personal and helpful as possible may overcome the impact of the necessary brevity of such interactions in a heavily-shopped area. Stores which cater to a wealthy clientele and which are strongly oriented to the latest fashions sometimes make customers feel uncomfortable because sales personnel assume an attitude of superiority and condescension toward shoppers. Such problems may be alleviated by educating sales personnel about the advantages of an increased volume of shoppers in the downtown area, even if those shoppers make no purchases.

Another consideration in the creation of a viable downtown shopping district is expanded hours of store operation. This factor has probably been understated in the literature on shopping behavior because studies have concentrated either on choice among suburban shopping centers (which have similar hours of operation) or on choice among small town shopping districts (which also have similar hours of operation). Many people probably shop in suburban shopping centers because they work during the day, and downtown stores are usually closed at night when these people do have time to shop. A downtown shopping district can provide the critical mass of shoppers necessary to allow stores to remain open as late as suburban shopping centers. However, if only a few large stores remain open in the downtown area, the absence of open secondary shops in the area may lead shoppers to continue to patronize suburban shopping centers where both large and

small stores are open late.

A few years ago two record stores in the Boston area demonstrated that shopping hours may be used in innovative ways to attract shoppers. These stores regularly offered "midnight sales" from 11:00 P.M. on Friday until 2:00 A.M. on Saturday. During this time, the entire stock of records was offered at a substantial reduction in prices. Thus a price-conscious record buyer could save a significant amount by delaying purchases until the time of the sale. Human traffic near the record stores was considerably heavier than it has been at the same time since the sales have been discontinued. The sales attracted both buyers and browsers and thus created natural surveillance of the area near the stores; apparently, the sales converted a "critical intensity zone" into an area which was, and was perceived to be, safe. Similar strategies of lowered prices during hours when shopping is usually light might be employed to increase business for other types of stores or for entire downtown shopping districts. The critical mass of people in large cities, especially cities with a good night life, might permit certain types of stores (e.g., record stores, grocery stores, or book stores) to remain open late at night and still show a profit during the late hours.

Urban designers know a considerable amount about how to construct a shopping area which will stimulate and reinforce the desire to shop in a particular place. A physical layout in which it is easy to find one's way around and which is visually pleasing will draw shoppers. Graphics which provide detailed information will enhance the imageability of an area. Wide sidewalks, good lighting, art work, and planters will all contribute to an attractive environment where people will choose to spend their leisure time. The enclosure of downtown shopping facilities will protect shoppers from the weather and thus allow downtown malls to compete with enclosed shopping centers in the suburbs. A number of downtown shopping areas in

the country have been enclosed; for example, there have been limited efforts to provide overhead shields from rain and snow in the heart of Boston's downtown shopping district. Enclosed shopping facilities should be open to view from outside streets, so that "people watching" and "street watching" are encouraged as a means of providing informal control over potential criminals.

Conclusion

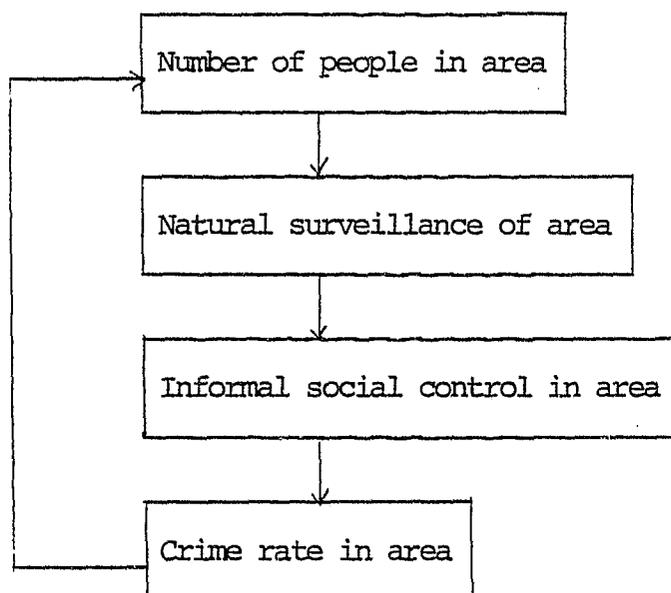
The CPTED model of crime reduction in the urban shopping district presented in Figure 1 (page 6) suggests that crime may be reduced through alteration of the image of an area. This will supposedly reduce fear of crime, lead shoppers to frequent the area, provide natural surveillance and informal social control, and thus deter (or displace) potential criminals. Little empirical research exists to demonstrate that the image of an area, or the fear of victimization in an area, are major determinants of where people decide to shop. Fear of crime may well be a more important influence on shopping decisions than has so far been demonstrated in research, because most existing research on choice of shopping locale has not asked respondents directly about fear of crime and most of that research has not been carried out within large metropolitan regions. In addition to its possible effects on shoppers' decisions, fear of crime may also discourage investment in high-crime urban areas and thus reduce shopping opportunities in the city. One spokesman for a store recently said that he was not interested in a downtown location for the store because of the many social problems, especially crime, which have to be faced in the city (Yudis, 1977: C1).

An evaluation of the CPTED commercial strip demonstration project in Portland found little evidence that the image of the area or the fear of crime in the area affected the behavior of residents of the community. Only 57 percent of a sample of residents were aware of at least one of the many changes made during the CPTED

revitalization effort (Lavrakas et al., 1978: 17-18); probably even fewer Portland residents who did not live near the commercial strip were aware of these changes. With such a low level of awareness of the changes which were supposed to alter the area's image, it seems unlikely that the chain of events suggested by Figure 1 will be set in motion. This evaluation also found that these changes had little impact on the psychological aspects of the area's image, including the imageability and the aesthetic quality of the area (Lavrakas et al., 1978: 22-23). There was also no clear evidence that fear of crime among residents declined as a direct result of changes made by the CPTED program (Lavrakas et al., 1978: 36-39). CPTED changes did produce some reduction in crime rates, but that reduction was not apparently attributable directly to a change in the image of the area which reduced fear of crime in a way to stimulate use of the built environment, enhance informal social control and thus prevent crime (Lavrakas et al., 1978: 55-58).

For a crime reduction strategy to be successful, it is not necessary that all stages in the model on page 6 be followed. A strategy which simply draws people to an area may still set in motion a series of changes which reduce crime. The Portland demonstration project experienced difficulty in increasing people's use of either the shopping or the recreational facilities in the area (Lavrakas et al., 1978: 21, 56). The most effective strategies for increasing the use of an area may not be directed toward changing the area's image or toward reducing fear of crime in the area. The following truncated model for crime reduction in an urban shopping district may be considered:

Figure 2: Truncated CPTED Model of Crime Reduction in the Urban Shopping District



What becomes critical in this truncated model is the attraction of people to an area. Efforts to do this by directly enhancing the downtown shopping experience have been made in such cities as Boston, Philadelphia, Baltimore, and Portland, Oregon. If such efforts are based on solid evidence about why people shop and how they choose where to shop, they may reduce crime by bringing more shoppers into the city, providing human traffic and natural surveillance, and reducing crime by establishing informal social control in public places.

BIBLIOGRAPHY

- Angel, Shlomo, "Discouraging Crime through City Planning," Working Paper No. 75. Berkeley: Space Sciences Laboratory and the Center for Planning and Development, University of California, February 1968.
- Bearden, William O., "Determinant Attributes of Store Patronage: Downtown versus Outlying Shopping Centers," Journal of Retailing 53 (Summer 1977), 15-22.
- Bell, Larry S., David R. Day, James M. Tien, and Lewis F. Hanes, Crime Prevention through Environmental Design: Commercial Demonstration Plan: Portland, Oregon. Arlington, Va.: Westinghouse Electric Corporation, March 1976.
- Bellenger, Danny N., Dan H. Robertson, and Barnett A. Greenberg, "Shopping Center Patronage Motives," Journal of Retailing 53 (Summer 1977), 29-38.
- Brunner, James A., and John L. Mason, "The Influence of Driving Time upon Shopping Center Preference," Journal of Marketing 32 (April 1968), 57-61.
- Conklin, John E., The Impact of Crime. New York: Macmillan Publishing Co., Inc., 1975.
- Cox, William E., Jr., and Ernest F. Cooke, "Other Dimensions Involved in Shopping Center Preference," Journal of Marketing 34 (October 1970), 12-17.
- de Jonge, Derk, "Images of Urban Areas: Their Structure and Psychological Foundations," in Robert Gutman, editor, People and Buildings. New York: Basic Books, Inc., 1972. pp. 271-290.
- Downs, Roger M., and David Stea, editors, Image and Environment: Cognitive Mapping and Spatial Behavior. Chicago: Aldine Publishing Co., 1973.
- _____, Maps in Minds: Reflections on Cognitive Mapping. New York: Harper & Row, Publishers, 1977.
- Furstenberg, Frank F., Jr., "Fear of Crime and Its Effects on Citizen Behavior." Paper presented at the Symposium on Studies of Public Experience, Knowledge

- and Opinion of Crime and Justice. Washington, D.C.: Bureau of Social Science Research. Inc., March 1972.
- Gould, Peter, and Rodney White, Mental Maps. London: Harmondsworth, Penguin, 1974.
- Hansell, Betsey, "High Priest of Shopping Centers," The New York Times, December 11, 1977, Section 3, p. 7.
- Herrmann, Robert O., and Leland L. Beik, "Shoppers' Movements Outside Their Local Retail Area," Journal of Marketing 32 (October 1968), 45-51.
- Jacobs, Jane, The Death and Life of Great American Cities. New York: Vintage Books, 1961.
- Jolson, Marvin A., and Walter F. Spath, "Understanding and Fulfilling Shoppers' Requirements: An Anomaly in Retailing?" Journal of Retailing 49 (Summer 1973), 38-50.
- Kaplan, Howard M., Larry S. Bell, Avishay Dubnikov, Imre R. Kohn, Richard M. Locasso, and Kenneth O'Kane, Crime Prevention through Environmental Design: Process Case Studies Report. Arlington, Va.: Westinghouse Electric Corporation, March 1977.
- Kohn, Imre R., Karen A. Franck, and Arlen Sue Fox, Defensible Space Modification in Row-House Communities. New York: The Institute for Community Design Analysis, Inc., November 1975.
- Ladd, Florence C., "Black Youths View Their Environment: Neighborhood Maps," Environment and Behavior 2 (June 1970), 74-99.
- Lavrakas, Paul J., Janice Normoyle, and J. J. Wagener, CPTED Commercial Demonstration Evaluation Report. Evanston, Ill.: Westinghouse Electric Corporation, February 1978, draft.
- Ledbetter, Les, "Portland, Ore., Acclaims Downtown Mall," The New York Times, September 27, 1977, p. 18.
- Lee, Douglas H. K., "The Role of Attitude in Response to Environmental Stress," The Journal of Social Issues 22 (October 1966), 83-91.

- Lynch, Kevin, The Image of the City. Cambridge: The M. I. T. Press, 1960.
- Mazze, Edward M., "Determining Shopper Movement Patterns by Cognitive Maps,"
Journal of Retailing 50 (Fall 1974), 43-48.
- Milgram, Stanley, "The Experience of Living in Cities: A Psychological Analysis,"
Science 167 (March 13, 1970), 1461-1468.
- Newman, Oscar, Defensible Space: Crime Prevention through Environmental Design.
New York: The Macmillan Company, 1972.
- The President's Commission on Law Enforcement and Administration of Justice,
Task Force Report: Crime and Its Impact — An Assessment. Washington, D.C.:
United States Government Printing Office, 1967.
- Rau, Richard M., "Westinghouse Consortium — Crime Prevention through Environmental
Design," in Law Enforcement Assistance Administration, Policy Development
Seminar on Architecture, Design and Criminal Justice. Washington, D.C.:
United States Government Printing Office, 1975. pp. 25-31.
- Reactions to Crime: Research Plan. Evanston, Ill.: Northwestern University, 1976.
- Redstone, Louis G., The New Downtown: Rebuilding Business Districts. New York:
McGraw-Hill Book Company, 1976.
- Rouse, W. Victor, W. Anthony Wiles, Edward J. Pesce, and Gilbert H. Castle III,
Crime Prevention through Environmental Design: Residential Demonstration
Plan: Minneapolis, Minnesota. Arlington, Va.: Westinghouse Electric
Corporation, November 1976.
- Samli, A. Coskun, and Ernest B. Uhr, "The Outshopping Spectrum: Key for Analyzing
Intermarket Leakages," Journal of Retailing 50 (Summer 1974), 70-78.
- Stone, Gregory P., "City Shoppers and Urban Identification: Observations on the
Social Psychology of City Life," American Journal of Sociology 60 (July 1954),
36-45.

Suttles, Gerald D., The Social Order of the Slum: Ethnicity and Territory in the Inner City. Chicago: The University of Chicago Press, 1968.

Tauber, Edward M., "Why Do People Shop?" Journal of Retailing 36 (October 1972), 46-49.

Thompson, John R., "Characteristics and Behavior of Out-Shopping Consumers," Journal of Retailing 47 (Spring 1971), 70-80.

Yudis, Anthony J., "Shopping Malls Moving Closer to Downtown," Boston Sunday Globe, January 8, 1978, p. F5.

_____, "The Trend in Shopping Centers Is Back Downtown," Boston Sunday Globe, October 30, 1977, p. C1.



(March, 1978)

DEFENSIBLE SPACE AS A FACTOR IN COMBATING FEAR AMONG THE

ELDERLY: EVIDENCE FROM SHERBOURNE LANES*

By

Frances Goldberg and William Michelson

* Prepared under contract (No. HS10.455) to Westinghouse National Issues Center, Arlington, Virginia. We are grateful to Dr. Imre Kohn for his interest in this assessment.



Many people think that architects and urban planners have techniques for manipulating the environment so as to alter public spaces in residential buildings and projects in such a way as to minimize crime and hence reduce fear. The general concept has been called defensible space (Newman, 1972). Very little research has been done concerning crime and the elderly (See Gross, p. 18). Clemente and Kleiman (p. 207) point out that even criminologists have generally ignored the area. Their claim is substantiated by a review of five years worth of Crime and Delinquency abstracts in which only a handful of articles dealing with crime and the elderly were unearthed - most of which related to crimes that the elderly commit and not those to which they are exposed.

This paper is addressed to an assessment of how the treatment of defensible space concepts in a new housing project can be shown to bear on fear among elderly residents. We examine the evidence regarding victimization but ask as well if the spaces created to minimize crime have actually led to the social situations serving as the hypothesized control mechanisms; in other words, if defensible space concepts worked, did they do so for the right reasons? We introduce additional evidence, too, which suggests the contextual limitations of focussing primarily on environmental design factors concerning the reduction of fear.

We first discuss the housing project studied and the logic of its defensible spaces (which frame the hypotheses to be pursued). Then we turn to brief discussions of the central foci of our analysis - the elderly and fear. Before turning to our findings, we discuss the methodology of our

study, including some consideration of victimization data. Our findings are of several order: a) on the possible consequences of defensible space for victimization and fear, b) on the hypothesized dynamics of defensible space, and c) on defensible space in a larger context of social control.

Sherbourne Lanes

The environment selected for investigation was Sherbourne Lanes, a newly erected housing complex situated immediately adjacent to Toronto's skid row.¹ In this densely populated downtown neighborhood, burglary/theft and assault are among the leading criminal offences (along with prostitution). Sherbourne Lanes is notable for a number of reasons; the following are just a few:

- 1) The uniqueness of the design... Two sprawling, low-rise apartment buildings were erected to meet the same habitable floor space and density as would have been provided by one high rise tower; the design technique of "infill" was used to permit structural integration.
- 2) The architects' conscious efforts to integrate the needs of the users into their design consideration... For the elderly, this meant an intention of housing them in the south building away from the noise of the children to the north and close to the shopping and transportation areas.

¹The low rise buildings were ready for occupancy as of October, 1976. Architects for Sherbourne Lanes were A.J. Diamond and Barton Myers, with the latter as partner in charge; their firm has since dissolved. We are grateful to David Oleson and Barton Myers of Barton Myers Associates, Architects/Planners, for their assistance during all phases of the study and to Michael Anderson, City of Toronto Housing Department, for his support and assistance in the administration of the questionnaire.

- 3) The development involved project residents in the conception of the project.
- 4) Its planning included crime prevention through environmental design.

We shall first give an overview of the major features of Sherbrooke Lanes, many of which we shall return to, and then expand on the aspects included in crime prevention through environmental design considerations.

The site itself was built at a density of 314 people (or 150 units) per acre (a density twice that of usual land coverage) and consists of 2 lowrise buildings and 17 renovated 19th century houses. Both lowrise buildings are oriented on a north-south axis in order to take advantage of the sun angles as well as give nearly all units east, west or south views. According to the architect "We (the firm) managed to accommodate as many people in that project as a 30 storey tower block". (Dalby, p. E1). The design of the site is evident in Figure 1.

The majority of the project's tenants are housed in the two rear buildings. The northerly building is 5 storeys tall and houses some families with children, all but two of whom have direct access to gardens. Most of the units have two exposures. As can be seen in Figure 2 access to these units is by internal site pedestrian system, as well as from a lane to the rear of the complex. The upper floors contain apartments which are mostly single-loaded and rely on a combination of exterior 'cat-walk' and interior hallways. In total, there are 49 family units provided within the older houses and the northern building. These range in size from 2 to

5 bedroom suites.

The southern portion of the site, a typical example of the double-loaded, highrise apartment building as described by Newman and Jacobs, was designed to house single persons in rooms (103 units) but has as well mini and one bedroom units (224 units). It was thought best to locate these units in the southern portion of the site, close to the commercial frontage, for two reasons: 1) the elderly would be the most likely tenants to rent these units; and 2) one of the primary needs and desires of the elderly is to be close to shopping (Golant, p. 113; Beyer and Nierstrasz, p. 57). In the southern building the halls are quite bright, doorways are recessed slightly and each pair of doors (opposite one another) is painted a matching color. The latter two techniques were used to provide an extended sense of territoriality.

Both buildings are equipped with balconies. Wherever possible, these were made of open metallic slats. In some cases too much privacy would be lost using this method and the balconies were then constructed of brick. Paths, shrubs and trees, and fences were strategically placed so as to denote private, semi-public and public territories and to encourage mutual use of space. Figure 3 indicates such spaces and visual vantage points.

In addition, a laundry room per floor, a gathering/social space in every building, the retention on the site of a meeting house, and the provision of concrete seats and tables in the open spaces were all included in the design so as to foster neighboring and sociability. The architects

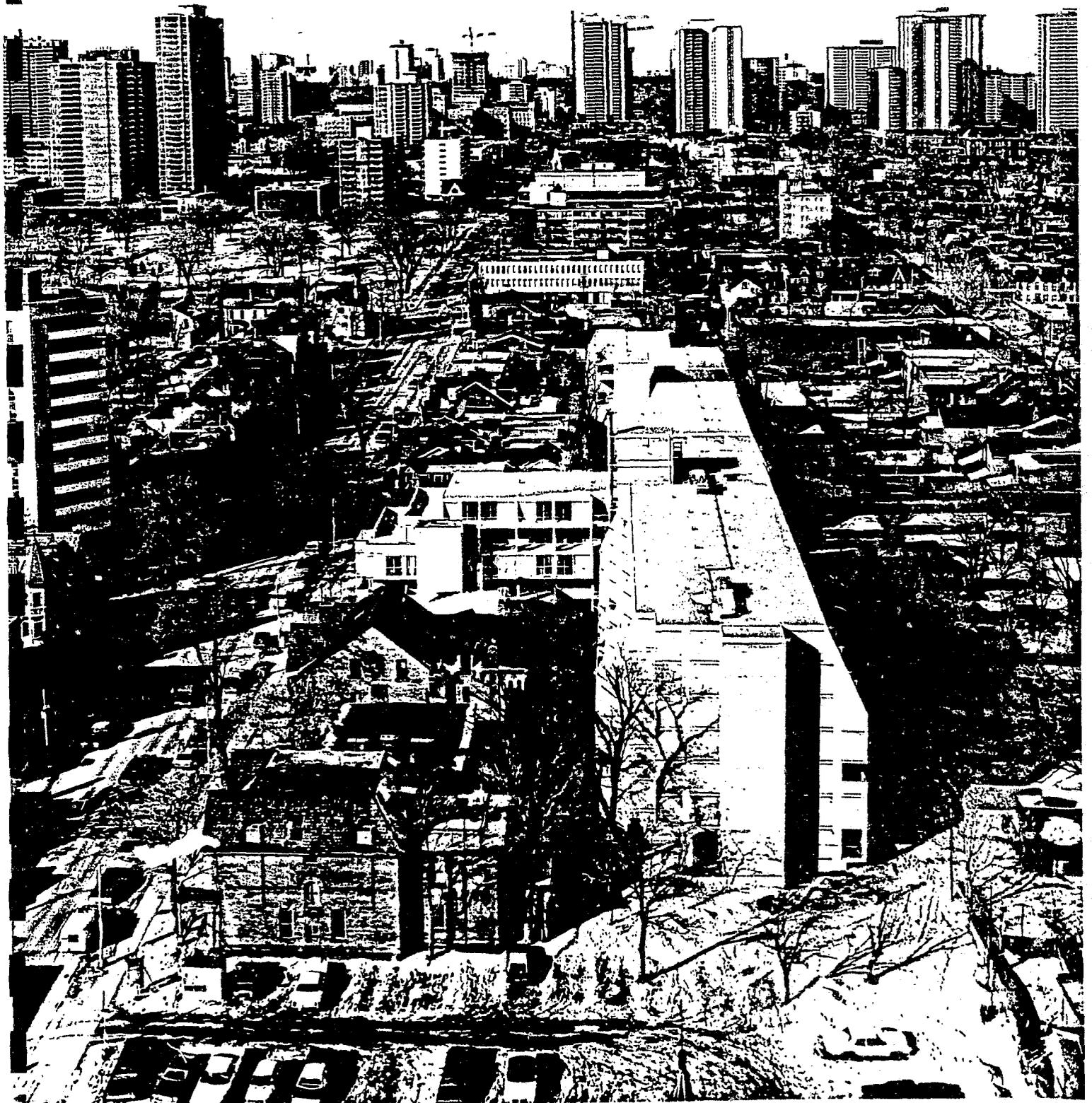


Figure 1. Overview of Sherbourne Lanes (facing North)
photo by Ian Samson)

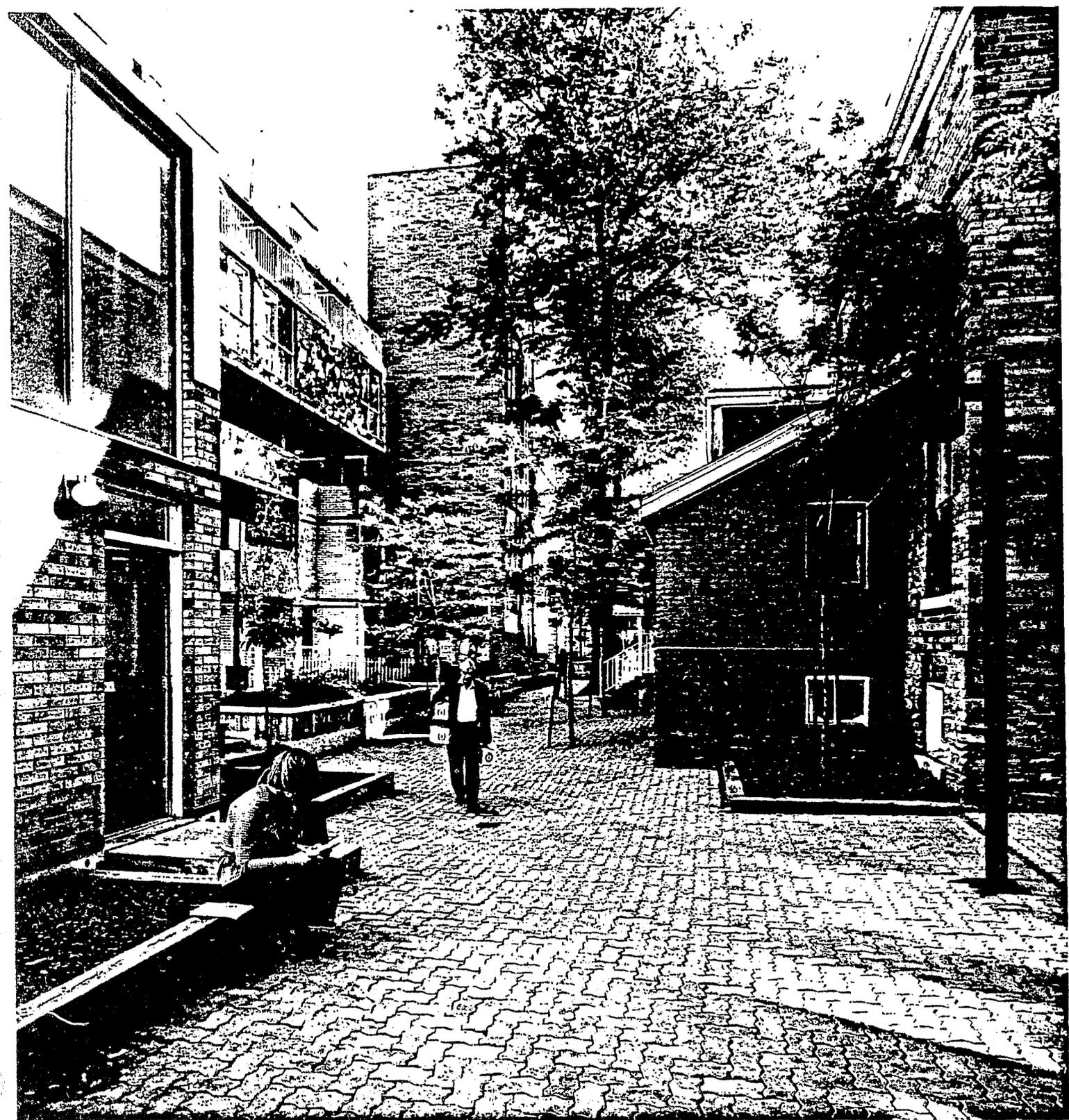


Figure 2. Internal courtyard and walkway to entrances (open door is to laundry room)

(photo by Ian Samson)

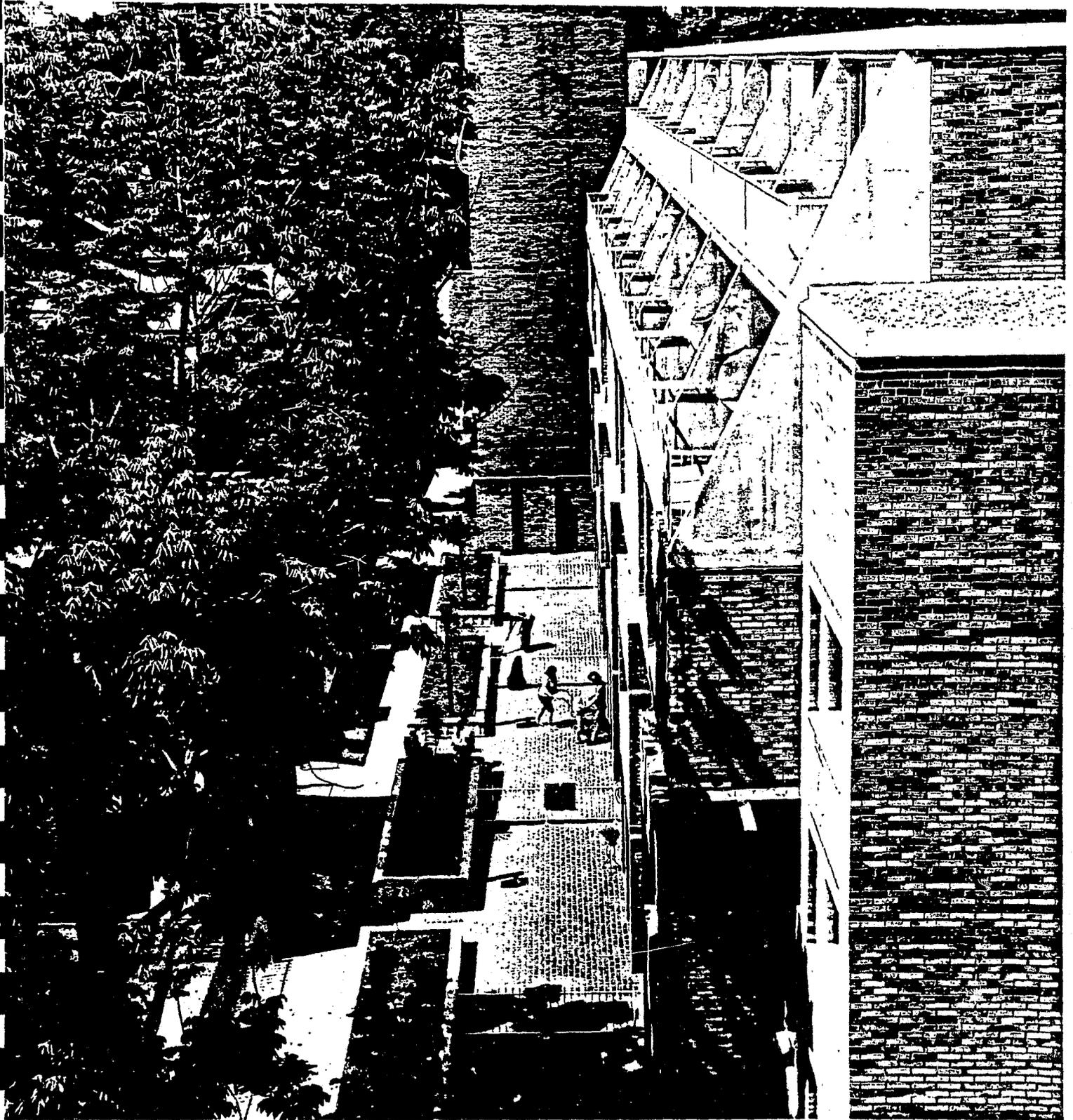


Figure 3. View of private and semi-public spaces intended to provide surveillance

(photo by Ian Samson)

Figure 4. An "open pillar" on elevated sidewalk - to optimize visibility
(photo by David Oleson)



were generally very conscious of the need to design in such a way that informal social networks would arise; these, in turn, would encourage inhabitants to regain a proprietary interest in their environment. One unusual example of this has to do with the structural concrete supports needed in the open 'cat-walks'. As solid slabs, these supports, shown in Figure 4, tend to act as barriers; yet the architects, in conjunction with the engineers, were able to open up the centers of these slabs while still retaining the necessary strength. By so doing, tenants were not visually isolated from one another and were expected to claim these 'pieces' as part of their semi-private space.

Windows, lights and open spaces were used wherever possible in an effort to open up the design and to provide general surveillance of public spaces.

Among these features, a number were intended at least partially for crime prevention. Let us look at them one by one, noting as well how each was intended to achieve its purpose.

a. Low Profile Design

Advocates of defensible space do not universally condemn high rise buildings per se. They point to aspects of conventional buildings like long, double-loaded hallways or unprotected elevators which can be bettered. Nonetheless, a common problem in high rise surrounds young people who, if more than a few units are allocated to families, must find their way to the upper and inner reaches of the buildings to get home. They are seen as both potential perpetrators and potential victims in the process.

By creating a low-rise profile, the architects intended to create a high percentage of dwelling units with ground contact to be allocated to families with children. This would give children more immediate access to their own units (for protection). It would also mean children would be obviously out-of-place and hence suspect were they to be found at the upper levels of the new buildings.

b. Entrances to Internal Courtyard

The pathways from the fronting street, Sherbourne Street, to the interior courtyard are paved with brick in contrast to normal grey concrete and designed in a small scale so as to disinvite general public access. These pathways are also clearly visible from many dwelling units in Sherbourne Lanes.

Their design is intended to create an impression that the walkways inside the project are semi-private, to be used only by the residents and those with legitimate reasons for entrance. Intruders are to be made to feel visible, having to openly traverse territory under surveillance by residents before reaching the building where most people live.

c. Interior Courtyard

Maintaining a large interior courtyard, fed by the semi-private walkways, and serving in turn as the entrance area to the largest new buildings, is also felt a form of protection against intruders and unsuitable actions.

Once again, the crucial mechanism is surveillance. It was assumed that a sufficient percentage of residents would visually inspect the people and activities in the courtyard. This would both inhibit intrusion and vandalism and provide a reservoir of assistance for anyone in distress. Several design factors, as follows in d, were intended to help provide such surveillance.

d. Balconies and Ground-level Private Gardens

The new back buildings were designed with balconies at upper levels and garden spaces were fenced in for the exclusive use of ground-floor tenants, in part to induce people to spend time overlooking and adjacent to the courtyard - to be in a position to survey it visually.

This was an attempt to provide a sufficient number of eyes for the protection of residents and guests in transit and of children at play. On those floors on which the balconies were cat-walks, serving as entrance halls to dwelling units, the design was intended to protect the persons there by putting them in the view of others down below and in the older buildings - and not at the mercy of others lurking in the conventional dark hallway.

The private gardens were also to make available safe places for young children to play, under the immediate view of their parents from inside.

e. Color-coded Hallways

These internal hallways were designed, lighted, and painted as mentioned earlier in this section, so as to create a

feeling of commonality among residents of neighboring units.

Such an effort was hypothesized to cut down on crime through the ability of neighbors who feel they share a territory to realize who belongs there and who does not. In addition, neighbors in a form of social contact with one another are hypothesized to be in a better position to cooperate for crime control.

The open pillars (Figure 4) were imagined to lead to the same effect (by cutting down on intervening barriers), as well as optimizing visibility (and thereby removing hiding places).

f. Glassed-in Lobbies, Staircases, etc.

An extensive use of glass, normally floor-to-ceiling, surrounds lobbies, stairwells, entrances to elevators, and the like in the new buildings. This makes movement into the new buildings and upwards open to view by those in the courtyard and from dwelling units on the opposite side.

Inasmuch as crime often takes place in non-private areas of buildings which are closed to public view while residents are coming and going from their own units, such an extensive use of glass was expected to cut down on unsuitable behavior by removing places for it to happen and by increasing the likelihood of detection. This hypothesis, like those above, still rests on the assumption that someone will be looking (or felt to be).

g. Provision of Meeting Places in Various Locations

Finally, the architects designed a number of potential meeting places. As described earlier, they were meant to foster some sense of community among the residents.

This creation of informal social networks was hypothesized to decrease crime in several ways: 1) by making residents more aware of who lives in the project and who does not and 2) by inducing a greater proprietary interest in the building, through a feeling of belonging (and reducing tendencies towards alienation and rejection).

In general, then, the various design aspects were intended to reduce crime through two mechanisms: 1) a high level of potential surveillance of most non-private areas in Sherbourne Lanes, including the removal of places for victimization to occur and the spatial specification of where children belong, and 2) the creation of some sense of community among residents, particularly among those in immediate proximity to one another.

In the study described, we attempted to assess the many hypotheses contained in these design assumptions:

- 1) that crime rates and fear would be low as a consequence of the aspects of design incorporated in Sherbourne Lanes, and
- 2) that the various design features would, one by one, induce the kinds of surveillance and contact, in the ways expected, so as to have a bearing on crime and fear.

We shall assess the general impact (to the extent possible) as well as the various specific design hypotheses listed above. But first let us

turn to the particular focus of our analysis - fear among the elderly. Because the chapter by Arthur Patterson goes into considerable detail in its review of "Crime and Fear of Crime Among the Elderly", we will limit the following discussion to considerations relevant to our own research design and analysis.

The Elderly

Certainly in terms of sheer numbers, the elderly do not comprise even one eighth of either American or Canadian populations. We chose, however, to study this particular group of individuals because of the general conclusion which the majority of authors, to date, have drawn regarding the living arrangements and conditions of most elderly citizens. Many, if not all, investigations agree that older citizens are generally 'easy' victims - this due, in large measure, to their diminished physical strength and stamina, and the visibility of such conditions. The researchers also tend to agree that the reduced income level of most elderly people, combined with the lowered levels of physical mobility, force these citizens to seek accommodation which is compatible with their conditions. What this means is that, for many, the only geographic location to meet both of these criteria is the central city, an area often identified with high levels of criminal activity. It is after having made this point that the authors begin to disagree. Some suggest that the elderly are quite often targets of repeated personal assault. (See Goldsmith & Tomas, 1974; also Kitchens & Forston, 1975) Others disagree with this statement quite adamantly and suggest that relative to their percentage of the population,

the elderly are one of the least victimized categories of society (see Clemente & Kleiman, 1976; also Sundeen & Mathieu, 1976). Goldsmith & Tomas (1974) go so far as to suggest that the kind of personal calamity which older persons feel is similar to, if not greater than, that resulting after civil disorder or natural disaster. In the latter instance, the individual is not alone, comfort is obtained from knowing that others are experiencing the same sorts of reactions. This is not so in the case of the elderly, where the person is often isolated, depressed, and frustrated.

For these reasons we felt that it would be useful to assess the degree of victimization among elderly persons of a new housing project in downtown Toronto which attempted to take both spatial and social organization into account in its design.

Fear

Fear of crime has been defined by one author as "the amount of anxiety and concern that persons have of becoming a victim". (Clemente and Kleiman, p. 214). Monahan and Catalano (p. 1) state that, "Fear of crime is a condition endemic to modern urban life. Almost one-half of the entire American population now reports being afraid to walk home alone at night. Women, the elderly, the poor, and racial minority groups contribute more than their proportional share to this fear".

Elaine M. Brody of the Philadelphia Geriatric Center places violence to the elderly in its logical perspective:

"The importance of the particular legal problem lies not only in its intrinsic importance, but in its personal and psychological significance. The landlord who raises the rent

excessively, the salesman who exploits, the health quack who deceives, the 'con' man who fleeces, inflict wounds to pride and dignity as well as to purse and person. Violence injures not only the physical self, but reinforces feelings of helplessness. Even a small loss may be the most recent in a series of 'insults', though superficially trivial, it may represent the proverbial last straw, or restimulate previous experiences of losses with their attendant painful emotions".

(quoted in Gelwicks & Newcombs, p. 11)

Blumin's study of victims in a Boston housing project confirmed that "... it is quite possible that the smaller number of victimizations of the elderly may result in more psychological, physical and economic harm than if done to younger people who experience more crime".

(Blumin, p. 49). At the National Conference on Crime Against the Elderly, Arthur S. Flemming, noted that some elderly people are so afraid of being vandalized at night that they sleep during the day and stay awake at night. "This is not living, it is surviving". (Aging, 1975, p. 5)

This example of altered behavior is not unique; it is merely reflective of the attitudes held by a growing sector of modern society of which the elderly are only a tiny group (see Fairley, p. 1). Other examples of behavior altered by fear of violence and its accompanying sense of insecurity are: not visiting friends in the city, not going out alone at night, not visiting friends in the neighborhood, doing almost no shopping at night, keeping doors locked when home, using additional locks and security chains, using peepholes in doors, changing direction if you see a stranger,

leaving lights on in the home when no one is there, and getting some sort of object, i.e. a gun, to protect yourself. If altered behavior is the consequence of fear, then one must certainly ask what the various reasons are for fear to exist. Several authors speak to this question.

Furstenburg distinguishes between concern about crime, which is related to resentment of changing social conditions, and a fear of victimization based on the elderly's perceptions of safety in their local neighborhood. (Gubrium, p. 247).

Gubrium hypothesizes that if elderly live in areas where comparatively extensive friendships exist among socially concentrated aged persons, these people will then have socially sympathetic and supportive relationships which diffuse their fears. In turn, in age-heterogeneous areas where such supportive relationships are not as common, isolates will have to deal with their fear of being victimized individually without many locally supportive relationships, thus causing fear to be magnified. Further, it is likely that persons who face their perceived problem of possible victimization alone will take greater precautions to minimize the risks than those who have a sense of social support. (Ibid) These two theories, in conjunction with the design hypotheses, helped to form the authors' own research design.

Study Design

The research undertaken by the authors was a two-phase process. The first part made use of an open-ended interview schedule administered by one of the authors (see Appendix 1). The protocol was divided into

four major sections, each of which tried to examine one aspect of the fear-victimization/environmental design discussion. Section 1 set out to obtain demographic and mobility data, to establish, among other things, whether or not Sherbourne Lanes posed any major problems in terms of adjustment (answer: no). If so, this could have had strong bearing on the perception of the environment and the kinds of activities which take place there.

Section 2 concerned neighborhood life as a whole, excluding the project itself. Questions on the availability of facilities, friendship patterns and satisfaction were asked to determine residents' feelings about the surrounding area.

Section 3 was focussed on the project itself. Relationships with neighbors, satisfaction with other tenants, site design, socializing, use of facilities such as the laundry room, participation in the tenants' association, and sense of security were all explored. Specific questions were asked about the security measures incorporated into the design.

Section 4 asked questions regarding crimes and resultant adaptive behaviors. Here reporting or non-reporting of the crimes to the police were examined, as well as the reasons for each action. The reliability of victimization studies has long been a source of lively discussion. There are those who believe that self-report victimization studies provide a reliable and sensitive measure of the incidence, type and distribution of data. There are, however, researchers who disagree strongly with that view and who, instead, believe that such studies are riddled with untruths, many as a result of fear. Our own view is that the questioning of

respondents about criminal activity, including vandalism, was essential in an effort to determine the range of experience of elderly people in Sherbourne Lanes with situations deemed problematic, as well as the locational and spatial details of incidents reported:¹

Interviews were completed with one or two persons in sixteen households, representing 50 percent of households containing only adults over 65 years of age. The remainder either did not agree to an interview or spoke a language other than English.

Approximately one month after all of the individual interviews had been completed, the researchers invited respondents to attend a follow-up group meeting, to learn of the findings, to discuss whether these findings were accurate, and to discover if there were other relevant phenomena to include in our assessment of Sherbourne Lanes. This meeting constituted phase two of the research design. The residents were eager to become part of the dialogue. Findings from phase one were upheld unanimously and amplified. No additional points were raised, though the group conversation did serve to reinforce the previous replies through the provision of thoroughgoing examples.

Those who participated were an average of 71 years of age. Two-thirds were male; although such a sex ratio is unusual for a sample of this cohort, it reflects an attempt to provide an alternate living environment for the men of the neighborhood who commonly live in rooming houses. Many of the smaller dwelling units are intended as a modern equivalent to the room in a rooming house.

¹ It has recently been brought to the authors' attention that M. Powell Lawton's 4-year study at the Philadelphia Geriatric Centre investigated issues similar to those queried about in this study. His data was not available to us at the time of this report and hence the two are not compared.

Although our findings rest on intensive study of a reasonably small sample of households, the results themselves were extremely clear-cut - representing virtual unanimity on almost every point. Thus, given sample size and the degree of unanimity, combined with the fact of two different means of data collection, we shall present our findings without resort to statistics. Where any finding represents anything less than a consensus, this will be noted.

Findings

A. Victimization

On the basis of the self-reported victimization, there is no reason to make negative conclusions about the effects of the design innovations. No respondent has been the victim of a crime to the person, or was anyone aware of anyone else living in the project who had been a victim. The only theft reported was encountered during the process of moving in; a chair was stolen while furniture was left temporarily unguarded in a lobby. The lobby had not been closed to additional pedestrian traffic at the time and it cannot, therefore, be established whether design was really at fault.

In fact, the most prevalent - and only other - crime reported concerned tampering with respondents' automobiles. These had been parked in the underground garage which, due to financial considerations only, had not had defensible space concepts incorporated. Three such reports were made.

B. Fear

Such an assessment of crime prevention through environmental design at Sherbourne Lanes is supported by results having to do with fear. The respondents reported that the public passages and spaces of Sherbourne Lanes were safe and that they do not fear walking in and through them at any time. This is underscored by what they do find fearful.

1. They worry about possible intrusion into their own dwelling units. Drunks and unruly visitors not infrequently knock on doors violently, instilling fear. As a result, most people have installed extra door locks for security.
2. They find the neighborhood around Sherbourne Lanes much more of a threat than the project itself. They hesitate to walk these streets at night alone, and are pestered at all times by drunks and panhandlers. None of the respondents have, however, been attacked by these groups of individuals. This finding does not support Furstenberg's hypothesis that fear in the project is based on the elderly's perception of safety in their local neighborhood. It could, however, be demonstrating one positive effect of the design - a reduced level of fear among the residents of the project.
3. They are put on edge by seeing the results of random acts of vandalism within Sherbourne Lanes which they think, but cannot substantiate, are committed by children living there. They never see the vandals: "Nobody ever sees anyone doing anything."

We interpret from the statements of the respondents that such vandalism as occurs happens late at night, when even the most visible areas are not under observation because no one is looking. This contrasts with feelings of safety during the hours of the day and evening when respondents are out and around. We shall return to the question of whether surveillance and "community" occur as hypothesized in various aspects of the design. But the present point is that such fear as comes from vandalism is not applied by the respondents to the daily lives they personally lead.

4. Almost half of the elderly residents had been bothered by obscene telephone calls.

To this point, there is no evidence to suggest that the aspects of defensible space in Sherbourne Lanes have not been acting in the interests of the elderly there. But lest one adopt an unduly critical point of view about these elements of design, several kinds of qualification must be made.

1. It is difficult to establish a definite criterion for success in this situation. Even though crime is not distributed uniformly in any city, Toronto has been traditionally known as a place with generally low rates across the categories of crime. The virtual absence of crime encountered by our elderly respondents in the defensible spaces of Sherbourne Lanes does not necessarily mean that the worst would have happened had the design been different.

2. Despite evincing little fear concerning the areas of Sherbourne Lanes to which the strategy of crime prevention through environmental

design was applied, the residents are no less fearful generally than they were in their previous housing, much of which was conventional, pre-defensible space high rise. Contributing to this is the disturbance they get from other, non-elderly residents (often "roomers") in their own dwelling units, from poor soundproofing,¹ and (accidental?) door knocking. One man went so far as to claim he was requesting a transfer back to one of Toronto's few, massive conventional housing projects, with an unsavory reputation.

3. Despite the virtual lack of problems for the elderly in areas for which special design measures had been incorporated, this does not necessarily mean that the concepts of defensible space were working in the ways expected. Residents need not be consciously aware of the components of their residential environment, nor of the purpose each component is to serve, for them to operate. In Sherbourne Lanes, the various features of defensible space in fact went without notice. Under questioning, however, the respondents gave evidence which did not always support the reasoning of previous writers. Let us examine these more specific hypotheses.

¹The soundproofing might well have been improved had better qualities of building materials been used. This was not an architectural short-coming; the grades of materials to be used were set down by Central Mortgage and Housing Corporation. "Crime prevention through environmental design" makes little reference to quality of design materials other than to state that they should be environmentally suitable. In this instance, C.M.H.C. made the decision that the materials for use in the project were suitable.

C. Mechanisms Underlying Defensible Space Concepts

1. The low rise design, coupled with the placement of families with children near the ground was intended in part to protect children and to keep them from destructive acts around the building. We did not seek data on the former hypothesis but our reports on the latter indicate the possibility that this expectation may have been realized: problems attributed to children occurred near the ground.

2. The design of the interior courtyard, and the walkways into it, were done so as to create semi-private space, defended by the eyes of neighbors (whether indoors, on balconies, or in ground floor, fenced-in open spaces). Yet, the majority of the respondents do not consider this space "theirs"; nor do they feel protected by it or obliged to defend it from intruders. All of the respondents agreed that they could see activities but most expressed little interest in really knowing or seeing what was happening (a far cry from the Greenwich Village of Jane Jacobs). They generally distrust other people and practice avoidance behavior.

3. Far from wanting an overview of life's passing scene, the elderly residents seem reticent to use their balconies and enclosed spaces because they find them not sufficiently private -- noisy and open. An extreme version of this view was stated by one respondent:

"As you may be aware, each tenant on the ground floor has his own small enclosure outside the sliding glass door; and, thinking that it would be enjoyable to sit out on pleasant evenings, an aluminum chair was purchased approximately a month ago. But alas, it was wasted money, for ever so often during the evening - and every evening! - the children come howling around my private section, even looking in the door (and marking the glass with their dirty fingers). I feel quite indignant over this, for it is evident that the children regard my section as equally their own - and the parents are aware of the trespassing and obviously do nothing about it. I wish now that I had not located on the first floor, at least, for then the objection outlined above would not apply, although the children's continual screaming could still be heard."

Among people who value privacy, a conflict can arise, when the hypothesized surveillance points are necessarily in public view. Electronic forms of surveillance can eliminate this conflict of values but is not as "natural" in occurrence.

4. The northern building has only single-loaded apartments, with the entrances from an open cat-walk. This elevated walkway was intended to act as a front yard for the units and hence be perceived as semi-private space - an extension of one's front door. For the most part, they do not use the cat-walk for socializing, though most will admit to having met

their immediate neighbors through its presence. The northern residents were split when asked if they preferred the open hallway to an enclosed one. Those who favored enclosed space did so primarily because it affords warmth. They would prefer being warm to being 'on view', again a conflict of values. The others selected the open 'hall' because it offered a view of the project, especially pleasant in summer. This choice had nothing at all to do with safety or sociability.

In the south building, units were designed in clusters of four to promote mutual identity. Nonetheless, the respondents living there did not know their immediate neighbors, as would have been expected had the defensible space rationales been operable.

5. The architects put forward a very conscious effort to provide glassed-in spaces whenever and wherever possible. They did so in the belief that spaces, continually on view, would be a deterrent to potential criminals. This belief cannot, however, be substantiated by the findings. Much of the vandalism has been in the glass lobbies. Respondents argued that there would be far less to repair if the expanses of glass were not as great.

6. The meeting places were not generally utilized by the elderly respondents, who had little, if any, feeling of community.

To this point, our argument is that the incidence, nature and location of criminal occurrences, as well as the contextual references of respondent fears, indicate that the planned defensible spaces may be functioning as intended -- but if this were to be the case, it is despite being unnoticed by elderly residents, without the peer support mechanisms expected (at least as maintained by themselves), and without any total

amelioration of fear.

Reference to other aspects of the organization of Sherbourne Lanes helps make this easier to understand and puts purely physical safety solutions in some degree of perspective.

D. Non-spatial Factors

Two complementary factors appeared closely related to the kinds of fears residents had on-site. The first has to do with the selection and distribution of tenants.

The respondents feel that during the earliest days after the completion of construction, the rental agents (and the city housing officers behind them) were more concerned with filling the units (a simple measure of "success") than with the personal qualities of the residents chosen. Furthermore, no effort was made to group the elderly in any specific part of the buildings, despite previous intentions. The outcome was that the elderly residents were living in close proximity to a heterogeneous selection of persons, many of whom were disruptive.

As management became aware of on-site difficulties, a number of evictions occurred -- none of them involving senior citizens. More recent tenants were subjected to a more complex screening process before their applications were accepted. The respondents are much more satisfied with the current behavior of their fellow residents.

Yet, the scattered placement of senior citizens creates problems. They do not relate to their immediate neighbors, whose noises irritate them -- whether they be from children, stereo, or loud parties. They have

little identity as a group -- and a virtual absence of social organization. One of the men attending our second phase meeting helps manage a meeting and card room in one of the buildings but had not yet come into contact with the others before our meeting. Only two of the participants had previously made acquaintance, and we had the feeling that the meeting might itself prove to have an unexpected catalytic effect.

We feel that the once-intended clustering of elderly residents would create more of an organizational context for social control mechanisms. It would also remove much of the fear of intrusion by extremely dissimilar neighbors. Not all elderly persons wish homogeneous clusterings, but those that do should have the option (including all those reporting to us).

The second non-spatial factor concerned the organization of Sherbourne Lanes. Systematic rules and procedures were not apparent to the respondents. This took a number of forms.

First, despite the long hoped-for evictions, residents were still not aware of clearly recognized rules, to define and then deal with unsuitable tenant behavior. They felt that many intrusions would not have been present had management made clear where the line was drawn.¹

Second, the elderly respondents were not aware whether the buildings had a superintendent and, if so, how to get in touch with him or her. This concern was further extended to include not knowing whom to contact in the case of an emergency. Several of the respondents did not have a phone and could not call for help even if a number was supplied to them. Those

¹ The City of Toronto Housing Department is, in its present form, relatively new. Unlike previous "public housing" authorities, its mandate is the provision of centrally-located family housing to subsidized and non-subsidized tenants alike. In the early days of its first projects, it is not surprising that the emphasis should be on development, design, and tenanting, rather than on defensive management.

with telephones felt as though their hands were tied by not having an emergency telephone number. Most of the tenants said that they thought twice before calling the police, especially if the problem was related to equipment or service failure. The respondents also indicated a hesitation to call on their neighbors for help. They believe that you don't ask a stranger for help. Although it is possible that people abuse the time of superintendents who are readily available, the result in the case of Sherbourne Lanes is that respondents felt almost totally adrift whenever a problem arose. They felt helpless without immediate on-site authority.

Patrolling guards were supplied by management. Although respondents appreciated their "presence," guards worked only extremely limited hours; furthermore, respondents were not aware of any means of reaching them when necessary, either. Hence, the effect of these guards on respondent fear is minimal.

When confronted with these 'omissions,' the management agreed that they had been lax in this area. They justified their behavior by stating that this, like all new projects, had its share of difficulties but now that these had been attended to, the 'omissions' would be seen to.

In summary, respondents' fears are exacerbated by the perceived absence of authority and social organization in Sherbourne Lanes.

What our assessment underscores is that even the most thoughtful physical design does not operate in a vacuum. For social support-based defense mechanisms to function as expected and for controllable fears to be thereby diminished, a variety of non-spatial, on-site considerations must be consciously attended to. In the case of Sherbourne Lanes, these include tenant selection and placement, as well as the systems of authority and organization. Although neither the overall situation nor the defensible space concept designs are shown untenable, fears remain, the amelioration of which should be controllable.

References

Aging, U.S. Department of Health, Education and Welfare Periodical.

- Number 207-208, Jan.-Feb. 1972, p. 3. 'Address By The President To The White House Conference On Aging'.
- Number 229-230, Nov.-Dec. 1973, p. 8. 'International Symposium On Housing for Elderly'.
- Number 244-245, Feb.-Mar. 1975, p. 6. 'New York Police Co-operating In Service To Elderly In Bronx'.
- Number 250, Aug. 1975, p. 4. 'Ford On Crime Message Notes Aging Among Violence Victims, Recommends Stiff New Statutes'.
- Number 250, Aug. 1975, p. 5. 'Flemming Urges Action In Crimes Against Elderly: Remarks At National Conference On Crime Against The Elderly'.
- Number 261, July-Aug. 1976, pp. 8-9. 'Minneapolis Initiates Crime Cautions for Seniors.

Bairstow, Dale. Demographic And Economic Aspects Of Housing Canada's Elderly. Ottawa: Central Mortgage And Housing Corporation, Policy Planning Division, May 15, 1973.

Bennett, Ruth. 'Living Conditions and Everyday Needs of the Elderly with Particular Reference to Social Isolation', International Journal of Aging and Human Development 4, 3 (1973): pp. 179-197.

Baum, Daniel Jay. The Final Plateau. Toronto: Burns & MacEachern, Ltd., 1974.

Beyer, Glenn H. and Wahl, Sylvia G. The Elderly and Their Housing -
Cornell University Agricultural Experiment Station, Ithaca New York,
Bulletin #989, December 1963.

Beyer, Glenn and Nierstrasz, F.H.J. Housing the Aged in Western Countries -
Programs, Dwellings, Homes and Geriatric Facilities. Amsterdam, London,
New York: Elsevier Publishing Company, 1967.

Beyer, Glenn H. and Woods, Margaret E. Living and Activity of the Aged.
Center for Housing and Environmental Studies, Cornell University Ithaca,
New York. Research Report #6, 1963.

Beyond Shelter - A Study of NHA - Financed Housing for the Elderly,
Michael J. Audain, Study Director. Ottawa: The Canadian Council on
Social Development, July, 1973.

Blumin, Deborah. Victims - A Study of Crime in a Boston Housing Project.
City of Boston: Mayor's Safe Streets Act Advisory Committee, 1973.

Bridges, John E. 'Security System 'By' the Residents, 'For' the Residents
Under Way in Public Housing in Kansas City, Missouri' in Public Housing
Management in the Seventies: Readings, Frederic M. Vogelsang (ed.).
Washington, D.C.: National Association of Housing and Redevelopment
Officials, 1974, pp. 87-94.

Canadian Architect (The), Nov/77, 'Sherbourne Lanes, Toronto'; pp 41-45

City of Toronto Planning Board. Dundas-Sherbourne Project: Interim
Planning Report. Toronto: City of Toronto Planning Board, October
1973.

Clemente, Frank and Dleiman, Michael B. 'Fear of Crime Among the Aged',
The Gerontologist 16, 3 (June, 1976): pp. 207-211.

Crawford, Lawrence. Research in the Field of Aging. Paper given at the
Plenary Session, Canadian Conference on Aging, Royal York Hotel, Toronto,
Jan. 25, 1966.

Crime Prevention Through Environmental Design in Minneapolis - A Progress
Report. Minneapolis: Governor's Commission on Crime Prevention, May
1976.

Cunningham, Carl. 'Patterns and Effect of Crime Against the Aging:
The Kansas City Study' in Crime and the Elderly, Jack Goldsmith &
Sharon S. Goldsmith (eds.) Lexington Massachusetts: D. C. Heath & Co.,
1976, pp. 21-29.

Dalby, Paul. '1980: High-Rises Could be our Dinosaurs' in The Toronto
Daily Star, July 16, 1977, p. E1.

Davies, Richard H. (ed.) Housing for the Elderly. California: Ethel
Percy Andrus Gerontology Center, 1973.

Donahue, Wilma (ed.) Housing the Aged. Ann Arbor: University of
Michigan, 1954.

Dunn, Christopher, S. The Analysis of Environmental Attribute/Crime
Incident Characteristics Interrelationships/ Phd. Thesis, State U. of
N. Y. at Albany, 1975.

Dussich, John P. J. and Eichman, Charles, J. 'The Elderly Victim: Vulnerability to the Criminal Act' in Crime and the Elderly, Jack Goldsmith & Sharon S. Goldsmith (eds.). Lexington Massachusetts: D. C. Heath & Co., 1976, pp. 91-97.

Ennis, Phillip H. 'Crime, Victims, and the Police', Transaction 4, 7 (June 1967): pp. 36-44.

Fairley, William and Liechenstein, Michael. Improving Public Safety in Urban Apartment Dwellings: Security Concepts and Experimental Design for New York City Housing Authority Buildings. New York: The New York City Rand Institute.

Gelwicks, Louis E. and Newcombs, Robert J. Planning Housing Environments for the Elderly. Washington, D. C.: The National Council on the Aging, Inc., 1974.

Golant, Stephen M. The Residential Location and Spatial Behavior of the Elderly: A Canadian Example. Chicago: University of Chicago, 1972.

Goldsmith, Jack and Tomas, Noel E. 'Crime Against the Elderly: A Continuing National Crisis', Aging. pp. 236-237 (June-July, 1974): pp. 10-13.

Goulding, W. S. Living Arrangements. Paper given at the Canadian Conference on Aging, Royal York Hotel, Toronto, January 24-28, 1966.

Green, Isaac; Fedowa, Bernard E.; Johnston, Charles A.; Jackson, William M.; and Deardorff, Howard L. Housing for the Elderly - The Development and Design Process. New York, Toronto, et. al.: Van Nostrand Reinhold Co., 1975.

Gross, Philip. 'Crime, Safety and the Senior Citizen' in The Police Chief, Feb. 1977, pp. 18,22,26.

Gubrium, Jaber F. 'Victimization in Old Age" Available Evidence and Three Hypotheses', Crime & Delinquency 20, 3 (July, 1974): pp. 245-250.

Harries, Keith D. 'Cities and Crime: A Georgraphic Model'. Criminology 14, 3 (November, 1976): pp. 369-386.

Home Office Research Study No. 34. Crime as Opportunity. London: Her Majesty's Stationery Office, 1976.

Jacobs, Jane. The Death and Life of Great American Cities. N. Y.: Vintage Books, 1961.

Katz, Sidney. 'Hell is Being Alone to Growing Crowd' in The Toronto Daily Star, Oct. 15, 1977, p. C4.

Kiff, Janet. 'A Review of Municipal and C.M.H.C. Requirements for Space about Residential Buildings'. Working Paper #9. Ottawa: Central Mortgage and Housing Corporation, Architecture & Planning, Professional Standards & Services Group, Feb. 1975.

Kitchens, James and Forston, Raymond. Criminal Victimization of the Aged - Houston Model Neighborhood Area. Texas: Center for Community Resources, North Texas State University, 1975.

Kohn, Imre, R.; Franck, Karen, A.; and Fox, Arlene Sue. 'Defensible Space Modifications in Row House Communities: Summary of Report Submitted to NSF'. New York, New York: Institute for Community Design Analysis, Nov. 1975.

Koncelik, Joseph A. Considerate Design and the Aging. Council of Planning Librarians Exchange Bibliography #253, January 1972.

Lawton, M. Powell. 'Assessment, Integration, and Environments for Older People', The Gerontologist 10, 1 (Spring, 1970): pp. 38-46.

Lawton, M. Powell; Nahenow, Lucille; Yaffe, Silvie; and Feldman, Steven. 'Psychological Aspects of Crime and Fear of Crime' in Crime and the Elderly, Jack Goldsmith & Sharon S. Goldsmith (eds.) Lexington Massachusetts: D. C. Heath & Co., 1976, pp. 21-29.

Levine, James P. 'The Potential for Crime Overreporting in Criminal Victimization Surveys'. Criminology 14, 3 (November 1976): pp. 307-330.

MacFarlane, Dianne (ed.). A Crime Prevention Workshop. Center of Criminology, University of Toronto, May 21 & 22, 1975.

Michelson, William. Man and His Urban Environment: A Sociological Approach. Reading, Mass., Addison-Wesley, 1970 (rev. ed. 1976).

Miller, Stuart J.; Bortollas, Clemens; Roberts, James; and Dinitz, Simon. Victimization and Indefensible Spaces in a Juvenile Institution. Paper presented at the 1975 Annual Meeting of the American Criminology Society, Toronto.

Monahan, John and Catalano, Ralph. 'Toward the Safe Society: Police Agencies and Environmental Planning', Journal of Criminal Justice 4, 1 (Spring, 1976): pp. 1-7.

Newman, Oscar. Defensible Space - Crime Prevention Through Environmental Design. New York: Macmillan Publishing Co., Inc., 1972.

Newman, Oscar. Design Guidelines for Creating Defensible Space. National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice, Washington, D.C., April 1976.

Niebanck, Paul L. The Elderly in Older Urban Areas. Pennsylvania: Institute for Environmental Studies, University of Pennsylvania, 1965.

Page, Dilys and Muir, Tom. New Housing for the Elderly. London: Bedford Square Press, 1971.

Patterson, Arthur. 'Territorial Behavior and Fear of Crime in the Elderly' in The Police Chief, Feb. 1977, pp. 42-45.

Sherman, Edmund A.; Newman, Evelyn S.; and Nelson, Anne, D.; 'Patterns of Age Integration in Public Housing and the Incidence of Crime Among Elderly Tenants' in Crime and the Elderly, Jack Goldsmith & Sharon S. Goldsmith (eds.) Lexington Massachusetts: D. C. Heath & Co., 1976, pp. 21-29.

Snyder, Lorraine Hiatt. The Environmental Challenge and the Aging Individual. Council of Planning Librarians Exchange Bibliography #254, January 1972.

- Social Planning Council of Metropolitan Toronto. The Aging - Trends, Problems, Prospects. March, 1973.
- Social Planning Council of Metropolitan Toronto. A Preliminary Study of the Social Implications of High Density Living Conditions. April 4, 1966.
- Social Planning Council of Metropolitan Toronto. Families in High Rise Apartments - A First Study. May, 1973.
- Statistics Canada 'Population Projections for Canada and the Provinces', Ottawa, Ontario, 1974.
- Stokken, Anne Marie. Power or Restlessness - Social Control in a Suburban Environment. Scandinavian Studies in Criminology, v. 5, 1974, pp. 67-81.
- Sundeen, Richard A. and Mathieu, James. 'The Fear of Crime and its Consequences among Elderly in Three Urban Communities'. The Gerontologist 16, 3 (June, 1976): pp. 211-219.
- Winiecke, Linda. 'The Appeal of Age Segregated Housing to the Elderly Poor, International Journal of Aging and Human Development 4, 4 (Number 293-306): pp. 293-306.
- Wolf, Robert. 'An Aid to Designing Prevention Programs' in The Police Chief, Feb. 1977, pp. 27-29.

Appendix 1

The Interview Schedule



CONTINUED

2 OF 7



1

SHERBOURNE LANES QUESTIONNAIRE

1. Demographic Data

Name of Respondent:

Address:

Contact Date:

Time of Interview:

Length of Interview:

Place of Interview:

Sex of Respondent:

Age of Respondent:

Marital Status - 1) Single, Never Married
2) Divorced
3) Widowed
4) Married, Living With Spouse (includes common-law)
5) Married, Not Living With Spouse

Last grade completed in school -
1) No school
2) Public school (grades 1-8)
3) High school - Some
- All
4) University - Some
- All
5) Other - explain

Occupation - 1) Current:
2) Past:

Approximately what was your household income last year?

Approximately what percentage of this was spent on housing?

2. Neighborhood - Excluding Site

For purposes of this questionnaire, neighborhood will refer to the area bounded approximately by Carlton St. to the north, Queen St. to the south, Jarvis St. to the west and River St. to the East. Included within this definition is the South of Carlton Working Committee area.

1. When did you move into this neighborhood?
(not the site itself though the response could be the same)

2. Where did you move from? a) area of city
b) type of dwelling

2. Neighborhood

3. What sort of accomodation did you move into first?
4. How often have you moved since entering this neighborhood?
5. Why did you choose this neighborhood?
6. How satisfied are you with this neighborhood as a place to live?
 - a) very satisfied
 - b) satisfied
 - c) neutral
 - d) dissatisfied
 - e) very dissatisfied
 - f) no opinion
7. What do you like about this area of the city as a place to live?
8. What don't you like about this area of the city as a place to live?
9. Do you have friends or relatives in the area?
 - a) yes
 - b) no
10. Were they a reason for your moving to this area?
 - a) yes
 - b) no
11. In general, do you like the people who live in this neighborhood?
 - a) yes
 - b) no
 - c) indifferent
 - d) don't know any
12. Does transportation pose any problem for you?
 - a) yes
 - b) no
13. What mode of transit do you use?
14. What facilities and services do you use -
 - a) for recreational purposes? Where are they?
 - b) for shopping for daily needs? Where are they?
 - c) for other shopping? Where are they?
 - d) for medical care? Where are they?
14. Are you satisfied that the facilities you've just mentioned are adequate for your needs?
 - a) yes
 - b) no

3. Site

1. Did you know anyone living in this development before you moved in?
 - a) yes, who?
 - b) no

3. Site

2. Have you made any efforts to get to know people who live in this ^{building} development?
 a) yes - what efforts have you made?
 b) no
3. About how many people in this ^{building} development do you know well enough to say say hello to? a) none
 b) 1-5
 c) 6-9
 4) 10 or more
4. About how many people in this ^{building} development do you visit back and forth with?
 a) none
 b) 1-5
 c) 6-9
 d) 10 or more
5. Do you ever help one another out in any way like-
 a) picking things up at the store? Sometimes Often Never
 b) borrowing & lending groceries?
6. In general, do you like the people who live in this ^{building} development?
 a) like
 b) dislike
 c) indifferent
 d) don't know anyone
7. How would you describe the people who live in this ^{building} development?
8. Do you have as much contact with the people living here as you would like, that is, is it too much, too little, or about right?
 a) too much
 b) too little
 c) about right
9. Some people living in apartments have said that they don't feel comfortable living so close to people they don't know. Do you feel this way about living here? a) yes
 b) no
10. Have you had any problems with any of the people living here?
 a) yes - please explain
 b) no
11. When you see other people socially is it more likely to be with:
 a) people who live in this building/development?
 b) people who reside in the surrounding neighborhood?
 c) people who live in other parts of Metro Toronto?
 d) relatives?
12. How satisfied are you with this ^{building} development as a place to live?
 a) very satisfied
 b) satisfied
 c) neutral
 d) dissatisfied
 e) very dissatisfied

3. Site

13. What do you like about this ^{building} development as a place to live?
14. What don't you like about the ^{building} development as a place to live?
15. Some people say that a superintendent and his wife are very important in making an apartment building a pleasant place to live. Would you say a superintendent is:
- very important - Why do you say this?
 - fairly important- Why do you say this?
 - not very important- Why do you say this?
 - don't know
16. Who do you think should take responsibility for the general appearance of the lobby and hallways in this building?
- management - Why do you say this?
 - tenants - Why do you say this?
 - combination of both - Why do you say this?
17. Do you think the rules and regulations in this ^{building} development are fair, for example, rules about visitors, children, pets, noise, deliveries?
- yes - Why is this?
 - no - Why is this?
18. If you have any complaint about living here, how do you deal with it?
19. Are you aware that there is a tenants' association for this development?
- yes
 - no
20. Do you make use of it?
- yes
 - no
21. In what ways do you think this organization could be useful or effective?
22. Do you find there is any kind of community spirit in this building?
- yes - Why do you say this?
 - no - Why do you say this?
23. Not including your own apartment, where else in or around the building do you spend time during an average week either alone or with others?
24. Ordinarily, when you use the elevator, laundry room or other public facilities in the building, do you prefer to have the use of these facilities alone or to come into contact with other tenants?
- alone
 - contact - Any group in particular?
25. Are you satisfied with the lighting of the halls, stair wells, and public spaces?
- yes
 - no
26. Do you feel that you are aware of what is happening on the site?
- yes - What are the reasons for this?
 - no - What are the reasons for this?

3. Site

- 27. When outside, are you able to see the movement of tenants and/or strangers?
 - a) yes
 - b) no
- 28. What features of the site design enable you to observe activity?
- 29. Do you think it is helpful to be able to see and know what is happening in the open space?
 - a) yes - Why is this?
 - b) no - Why is this?
- 30. Do you feel some sort of responsibility for this project?
 - a) yes
 - b) no
- 31. Did you feel this way in the other ^{buildings} developments as well?
 - a) yes
 - b) no
- 32. Are you satisfied with the size and shape of your own apartment?
 - a) yes
 - b) no
- 33. If you could change anything about it, what would this be?
- 34. How much time do you estimate that you spend outside of your apartment per day?
- 35. Where is most of this time spent?
- 36. Do you plan to move from this project in the near future?
 - a) yes
 - b) no

4. Crime And Fear

- 1. Have you been a victim of any of these crimes in the last year?

Robbery	a) yes	b) no	c) how many times?	(ask questions 4-14)
Burglary	a) yes	b) no	c) how many times?	(ask questions 15-25)
Auto theft	a) yes	b) no	c) how many times?	(ask questions 26-37)
Theft	a) yes	b) no	c) how many times?	(ask questions 38-48)
Swindling	a) yes	b) no	c) how many times?	(ask questions 49-60)
Assault	a) yes	b) no	c) how many times?	(ask questions 61-75)
Purse snatching	a) yes	b) no	c) how many times?	(ask questions 76-88)
Rape	a) yes	b) no	c) how many times?	(ask questions 89-101)

a) Robbery

- 2. Have you been a victim of robbery in the last year?
 - a) yes - In this site?
 - b) no
- 3. When did this happen; what was the date?

a - Robbery

4. What was the time of day?
5. What day of the week was it?
6. Where did this happen?
 - a) in your home
 - b) on the street in the development
 - c) on the street in the neighborhood
 - d) other
6. Were you alone at the time?
 - a) yes
 - b) no
7. Did the offender enter the house against your will? (from #6)
 - a) yes
 - b) no
8. Did you know the offender? (if answer is not 1, how well did you know the offender?)
 - a) didn't know him/her
 - b) spouse
 - c) former spouse
 - d) acquaintance
 - e) other relative
 - f) other
9. Sex of offender. a) male b) female
10. Approximate age of offender.
11. Was he/she
 - a) white
 - b) negro
 - c) other
12. Did he/she do this because he/she was angry at something you had done?
 - a) yes - What was this you had done?
 - b) no
13. Was this crime reported?
 - a) yes - To whom was it reported?
 - b) no
14. Why did you report the crime?

b - Burglary

15. Have you been a victim of burglary in the last year?
 - a) yes - In this site?
 - b) no
16. When did this happen; what was the date?
17. What was the time of day?

b - Burglary

18. What day of the week was it?
19. What was the relationship of the offender to you?
a) didn't know him/her
b) former spouse
c) acquaintance
d) other relative
e) other
20. Sex of offender. a) male b) female
21. Approximate age of offender.
22. Was he/she a) white
b) negro
c) other
23. Did he/she do this because he/she was angry at something you had done?
a) yes - What was this you had done?
b) no
24. Was this crime reported?
a) yes - To whom was it reported?
b) no
25. Why did you report the crime?

c - Auto Theft

26. Have you been a victim of auto theft in the last year?
a) yes - In this site?
b) no
27. When did this happen; what was the date?
28. What was the time of day?
29. What day of the week was it?
30. Where was the car when it was stolen?
a) in the neighborhood
b) in the parking garage
c) other
31. What was the relationship of the offender to you?
a) didn't know him/her
b) spouse
c) former spouse
d) acquaintance
e) other relative
f) other
32. Sex of offender. a) male b) female

c - Auto Theft

33. Approximate age of offender.
34. Was he/she a) white
 b) negro
 c) other
35. Did he/she do this because he/she was angry at something you had done?
 a) yes - What was this you had done?
 b) no
36. Was this crime reported?
 a) yes - To whom was it reported?
 b) no
37. Why did you report the crime?

d - Theft

38. Have you been a victim of theft other than robbery and burglary (and, women only, purse snatching) in the last year?
 a) yes - In this site?
 b)
39. When did this happen; what was the date?
40. Was was the time of day?
41. Was day of the week was it?
42. What was the relationship of the offender to you.
 a) didn't know him/her
 b) spouse
 c) former spouse
 d) acquaintance
 e) other relative
 f) other
43. Sex of offender. a) male b) female
44. Approximate age of offender.
45. Was he/she a) white
 b) negro
 c) other
46. Did he/she do this because he/she was angry at something you had done?
 a) yes - What was this you had done?
 b) no
47. Was the crime reported?
 a) yes - To whom was it reported?
 b) no
48. Why did you report the crime?

e - Swindling

49. Have you been a victim of seindling or a 'con game' in the last year?
a) yes
b) no
50. When did this happen; what was the date?
51. What time of day were you approached?
52. What day of the week was it?
53. Where were you when you were approached?
54. What was the relationship of the 'con man' to you?
a) didn't know him/her
b) acquaintance
c) relative
d) other
55. Sex of offender. a) male b) female
56. Approximate age of offender.
57. Was he/she a) white
b) negro
c) other
58. What was the extent of your loss in the transaction?
59. Did he/she do this because he/she was angry at something you had done?
a) yes - What was this you had done?
b) no
60. Was the crime reported?
a) yes - To whom was it reported?
b) no

f - Assault

61. Have you been a victim of assault in the last year?
a) yes - In this site?
b) no
62. When did this happen; what was the date?
63. What was the time of day?
64. What day of the week was it?
65. Where did this happen?
a) in your home
b) in the development
c) in the neighborhood
d) other
66. Were you alone at the time?
a) yes
b) no - Who was with you?

f - Assault

67. Did the offender enter the house against your will?
 a) yes
 b) no
68. What was the relationship of the offender to you?
 a) didn't know him/her
 b) spouse
 c) former spouse
 d) acquaintance
 e) other relative
 f) other
69. Sex of offender. a) male b) female
70. Approximate age of offender.
71. Was he/she a) white
 b) negro
 c) other
72. What weapon was used?
 a) offender's body (such as hitting with hands or fists)
 b) knife
 c) other object
 d) more than one of the above
73. Did he/she do this because he/she was angry at something you had done?
 a) yes - What was this you had done?
 b) no
74. Was the crime reported?
 a) yes - To whom was it reported?
 b) no
75. Why did you report the crime?

g - Purse Snatching

76. Have you been a victim of purse snatching in the last year?
 a) yes - In this site?
 b) no
77. Where did this happen?
 a) in the neighborhood
 b) in the development
 c) other
78. Were you alone?
 a) yes
 b) no - Who was with you?
79. When did this happen; what was the date?
80. What was the time of day?
81. What day of the week was it?

g - Purse Snatching

82. What was the relationship of the offender to you?

- a) didn't know him/her
- b) acquaintance
- c) relative
- d) other

83. Sex of offender. a) male b) female

84. Approximate age of offender.

85. Was he/she

- a) white
- b) negro
- c) other

86. Did he/she do this because he/she was angry at something you had done?

- a) yes - What was this you had done?
- b) no

87. Was the crime reported?

- a) yes - To whom was it reported?
- b) no

88. Why did you report the crime?

h - Rape

89. Have you been a victim of rape in the last year?

- a) yes - In this site?
- b) no

90. Where did this happen?

- a) in your home
- b) on the street in the neighborhood
- c) somewhere in the development
- d) other

91. Were you alone at the time?

- a) yes
- b) no - Who was with you?

92. Did the offender enter the apartment against your will?

- a) yes
- b) no

93. When did the rape happen; what was the date?

94. What was the time of day?

95. What day of the week was it?

96. What was the relationship of the offender to you?

- a) didn't know him
- b) former spouse
- c) acquaintance
- d) relative
- e) other

h - Rape

97. Approximate age of offender.

98. Was he: a) white
 b) negro
 c) other

99. Did he do this because he was angry at something you had done?
 a) yes - What was this you had done?
 b) no

100. Was the crime reported?
 a) yes - To whom was it reported?
 b) no

101. Why did you report the crime?

i - General

1. When you go walking around the neighborhood, are you concerned or afraid about things that might happen?
 a) yes
 b) no

2. What do you have in mind happening?

3. Do you feel that way more at some times of the day than at others?
 a) yes
 b) no

4. Think about problems in this project; do you feel:
 a) safe anywhere at anytime
 b) safe, if you're careful
 c) unsafe sometimes, no matter what you do, or
 d) unsafe most of the time
 e) other

5. Are you afraid to wait at a bus stop in this neighborhood?
 a) daytime
 b) nighttime
 c) no

6. As a result of the number of crimes against the elderly, have you found it necessary to change the way you live or behave?
 a) yes - How have you changed?
 b) no

7. Have you always been afraid of being criminally assaulted or do you think that this is just a recent occurrence?
 a) always
 b) recent

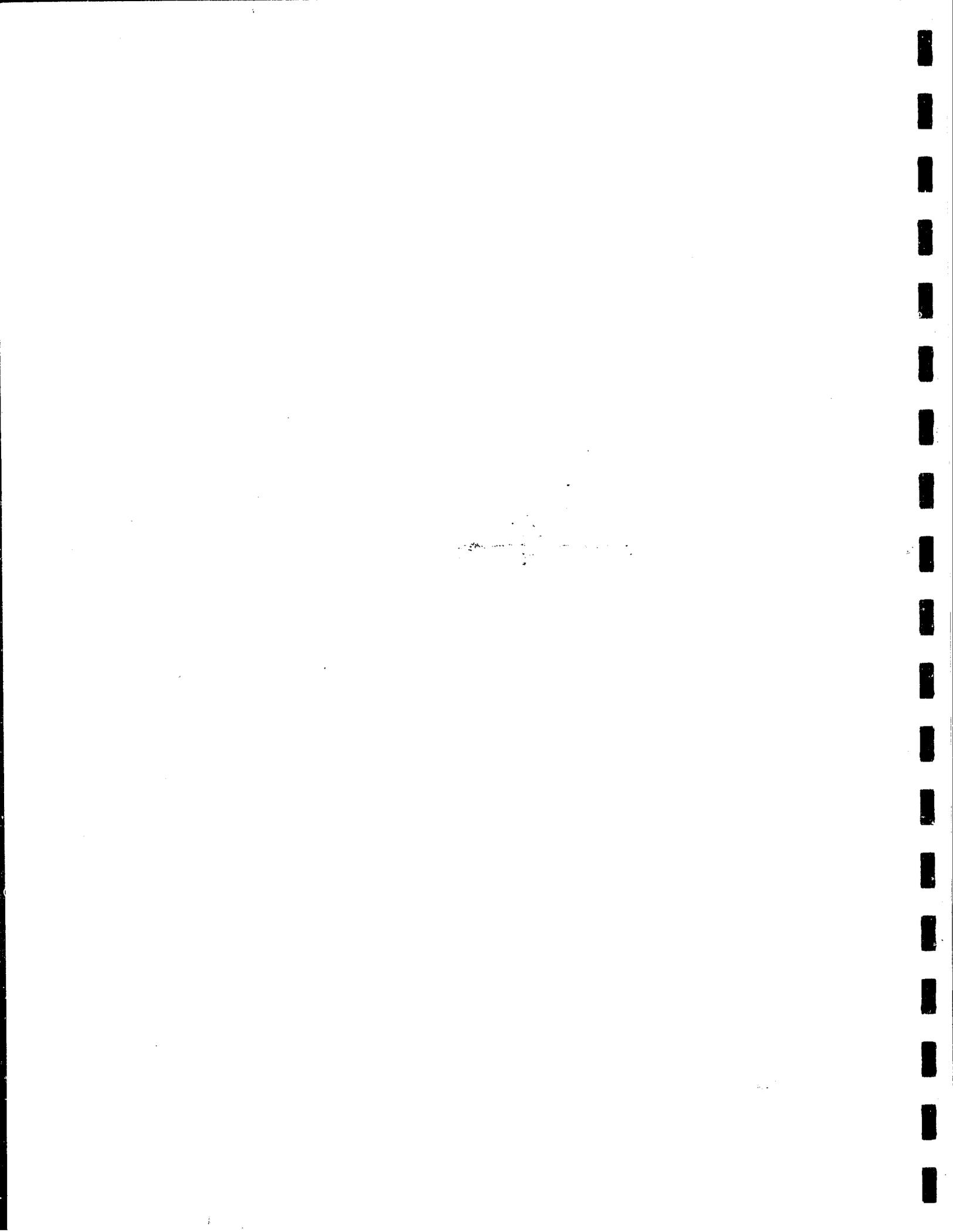
8. Has fear, or the lack of it, increased with age?
 a) yes
 b) no

9. What is your attitude towards the Metro Toronto police force?

CRIME PREVENTION IN THE CONTEXT OF
ENVIRONMENTAL PSYCHOLOGY

William H. Ittelson
University of Arizona

Second Draft
February, 1978



Introduction

This paper will consider the place of crime prevention through environmental design in the general context of contemporary work in Environmental Psychology. The basic assumption underlying design approaches to crime prevention will be placed within the theoretical assumptions of Environmental Psychology, their adequacy assessed in relation to that theoretical framework and suggestions will be offered for possible future directions. In order to accomplish this, the historical context in which Environmental Psychology emerged as a separate field of study will be described to establish the broad intellectual trends represented by studies of environment and behavior in general. Then the specific forms which this thinking has taken over the last 20 years of work will be examined in more detail with particular reference to CPTED. Finally, implications and suggestions for future directions will be outlined.

The theoretical assumptions underlying CPTED can be derived directly from current work and are stated more or less explicitly in a number of LEAA sponsored reports. Using Elements of CPTED (Tien et al. 1976) as our primary source, four "design concepts" are listed as underlying the CPTED approach: "(1) access control . . . operates to keep unauthorized persons out of a

particular locale; (2) surveillance . . . consists basically of keeping potential offenders under observation; (3) activity support . . . involves methods of reinforcing existing or establishing new community activities . . . and (4) motivation reinforcement which seeks . . . to affect . . . offender motivation [and] to elicit positive, motivation-based behavior on the part of the non-offender" (p. xiii, cf also Chapter 3). Insofar as these design concepts are "statements regarding the interaction between human behavior and the built environment" they can be reduced to two theoretical assumptions which will be crudely stated here and elaborated as we proceed. The first assumption holds that environments influence behaviors occurring within them and the second states that environments influence the total set of experiences that individuals have within them. Both of course are concerned with overt behavior, the first directly and the second indirectly. They also, as we shall shortly see, derive from the core assumptions underlying all contemporary work in the study of environment and behavior relationships.

Origins of Environmental Psychology

Environmental psychology, or more generally the study of environment and behavior, as we know it today,

was born in the year 1957. Any such specific dating of a broad intellectual movement is of course arbitrary and probably illusory, but in this instance, we have a particular confluence events which makes the year 1957 a useful reference point. Humphrey Osmond's (1957) paper on "Function as the Basis of Psychiatric Ward Design" is probably best known for its introduction of his concepts of sociofugal and sociopetal spaces, but Osmond did more than that. He specified a list of behavioral requirements which environments could aid or hinder; he emphasized the importance of the way the large-scale environment is experienced; he suggested approaches toward the design of environments based on desired behavioral outcomes; and his conclusions were based on the work of an interdisciplinary group of psychiatrists, psychologists and architects. Admittedly, Osmond in 1957 was writing about psychiatric hospitals and psychiatric patients, but his paper can with considerable justification be seen as laying down the model on which 20 years of work in environmental behavior has been based. It also shows that the assumptions later endorsed by CPTED were clearly incorporated into the earliest work in environmental psychology.

Events moved quickly in the next year or two, and again one can single out a few arbitrary milestones.

Baker, Davies and Sivadon published "Psychiatric Services and Architecture" in 1959, although the first draft was prepared in 1957, thus making it contemporaneous with Osmond. Here again, in a collaboration between two psychiatrists and an architect, the behavioral criteria for architectural design are emphasized and design approaches suggested. This general constellation of ideas clearly was in the air at that time, as is further shown by the first meeting of the AIA research committee in 1958, at which the general issue of architecture and behavior was the main item on the agenda and the first formal proposal for a systematic program of post-occupancy evaluation was put forward.

Architecture, although clearly taking the initiative, was not the only field touched by the interacting currents of that time. The social sciences were ripe for new directions of thought. One can cite again, as an almost arbitrary example from a potentially long list, Hall's (1958) publication of "The Silent Language," a forerunner of his later and more influential "Hidden Dimension." Examples from the other social sciences could just as well be cited. It should be noted that CPTED emerged as a special field of study rather late in this era. Its formal beginnings are most properly placed in 1969, with the creation of the National Institute for

Law Enforcement and Criminal Justice, but it was not until three or four years later that the formal recognition of environment-behavior relationships emerged as a viable approach to crime prevention. However, we will without further elaboration assume that the assertion that the year 1957 represents the birth of modern environmental psychology has some justification. And this in turn means that we have a clear span of 20 years of work in this field to evaluate both as an enterprise in its own right, and as foundation on which future endeavor can be constructed.

Intellectual Antecedents

However, before proceeding with that undertaking, a further excursion into the past may be illuminating. A date such as 1957 can be a nodal point in intellectual thought, but it does not and cannot represent a discontinuity in the history of thought. Many paths, many directions and many individuals, over both the near and the far periods of time, provide the intellectual impetus for the emergence of a new field of study. The search for intellectual antecedents is a fascinating and never-ending program. The details can profitably be left to the experts in the history of ideas, but one cannot work in, or read about, contemporary environmental

studies without becoming acutely aware of the influence of some of the more immediate intellectual forerunners. The intellectual debt all of the social sciences owe to Kurt Lewin has not and probably cannot be adequately expressed. This modest man of incalculable achievement, coming from the European tradition and yet spawning a truly American approach to the social sciences, is the silent co-author of much of the current writing in the field of environment and behavior and indeed of all social science approaches to social problems. Harry Stack Sullivan, perhaps the only authentic and certainly the greatest American psychiatrist, combined a deep and sympathetic understanding of the human condition with a hard and rigorous understanding of its roots which we ourselves have created as the conditions of living. The best of environmental psychology continues to try to wed these two components. G. H. Mead, both by his life and his teachings, provides another model for all students of humans in their environment. Running counter to the mainstream of American sociology with its emphasis on systematic structure, Mead developed a functional understanding of man's role in nature, which has gradually become one of the dominant themes in environmental studies. And finally to complete our quartet of grandparents, we must add the name of John Dewey, whose influence on

American intellectual life has become so all-pervasive that it is rapidly becoming unnoticeable. None of these men lived to see the year 1957, but their spirit is as alive today as ever. Their relevance to our immediate discussion derives from two arguments, first, they provided the intellectual position within which studies of environment and behavior, including CPTED, emerged and, second, as explicitly formulated, contemporary environment and behavior, including CPTED, is a pale and partial representation of that position. Collectively they, and the intellectual currents they represent, gave us a picture of man with two major characteristics. First, human beings are necessarily and primarily part of the world and of nature. Dewey might have been speaking collectively for all when he saw "Man-in-action, not as something radically set over against an environing world, nor yet as merely action in a world, but as action of and by the world in which man belongs as an integral constituent." But equally important is a second proposition, which sees humanity as occupying a unique position and playing a unique role within the world of which it is a constituent part, a role which gives humanity responsibility for both its own and nature's destiny.

Earlier Environment-Behavior Views

Before examining how these broad themes were operationalized into principles underlying work in environment and behavior, it is instructive to look at the constellation of beliefs about man's relationship to his environment which formed the dominant themes until 20 years ago. To describe them as chaotic and contradictory is probably to understate the case. On the one hand, there lies the concept of environmental determinism, with a long history in human thought, which holds that a wide range of human behavior is directly and entirely determined by the environmental circumstances within which the behavior occurs. At the same time we find the equally influential but opposite view of environmental adaptation which sees human behavior as infinitely adaptable, and hence the environment becomes irrelevant.

Environmental determinism has been held at one time or another by at least some proponents of almost every area of the social sciences. However, a more direct concern to the immediate discussion is the related concept of architectural determinism, which formed a main theme in much architectural theorizing and practice. LeCorbusier's famous dictum that a house is a machine for living is perhaps not as extreme a statement of architectural determinism as was Neutra's perhaps less known

claim that he could design a house which would guarantee either a happy or a disruptive marriage. This type of statement, echoed innumerable times, represented a mainstream in architectural thinking which if not totally abandoned within the last 20 years, has at least become a rather minor and perhaps idiosyncratic position. Among many writers who have argued the case against architectural determinism, probably none have done so more eloquently than Broady (1968).

However, it is a curious historical contradiction, that paralleling the belief in environmental determinism ran a perhaps more powerful trend within the behavioral sciences, which essentially viewed the environment as irrelevant to human behavior, or if not totally irrelevant at least inconsequential or peripheral. This line of thinking took many specific forms. For example, largely in the sociological literature, the concept of the environment as a stage setting was developed. The environment is seen as a stage on which the drama of life is enacted (cf. Goffman). Like a stage set, the environment may add color and nuances, it may perhaps make some actions more salient, and others less so, but in the last analysis the play has already been written and unfolds relatively independent of the stage on which it takes place.

Social scientists who were particularly impressed with man's adaptive ability have been inclined to give even less of a position to the environment. Anthropologists, although very interested in the environmental settings for their studies, nevertheless succeeded in showing that a wide range of essentially similar human behaviors can occur in vastly different environments. This evidence, coupled with the evolutionary insistence on the extreme adaptability of the human to a range of environmental conditions, made environmental adaptation a keynote for a large body of work. This position in its most extreme form holds that man can adapt successfully to almost any environmental condition and that in this sense the environment is an irrelevant consideration in understanding human behavior.

Belief in environmental adaptation, like environmental determinism, has collapsed within the last 20 years under the onslaught of two different kinds of evidence. One, of course, is the growing evidence that the position is simply wrong, that it is at least possible to create environments to which we not only cannot successfully adapt but within which we may not even be able to survive. A parallel source of evidence is the growing body of knowledge about the toll that adaptation exacts. Adaptation is always at a price, and the price in terms of reduced efficiency and quality of

living may be too high to pay. The most eloquent and influential writer in this vein is certainly Rene Dubos, whose "Man Adapting" represents a recognized landmark.

These two obviously contradictory and demonstrably unsuccessful views of environmental determinism on the one hand and environmental adaptation on the other were replaced rather abruptly 20 years ago by the belief that the environment is directly and importantly relevant for human behavior, and that it is relevant in particular ways. When we recognize the prevailing views into which these beliefs were introduced, it is not surprising that the net result was not a final or definitive approach and that twenty years of study may reveal the need for reconceptualization.

Contemporary Principles of Environment and Behavior

Two general principles emerged which have become the cornerstones of work over the past 20 years. They were already articulated in Osmond's 1957 paper and, as we have already briefly seen, were later incorporated into the working assumptions of CPTED. We will label these two principles of environment-behavior relationships (1) Environment as facilitator of behaviors and (2) Environment as stimulus for experience.

The principle of environmental facilitation sees environments neither as determining behavior nor as the

passive setting within which behavior occurs, but rather as interacting actively with the behaving individual in such a way that certain environments are more likely to elicit certain kinds of behavior and to inhibit other kinds of behavior than are other environments. This principle of environmental facilitation has led to a large volume of work in the past 20 years, work impressive not only in its magnitude but also in its quality. In general, this body of studies has either looked at environments to see what kinds of behavior are facilitated, or has looked at particular behaviors to see what kinds of environments may facilitate or inhibit them. The overall product is usually intended to be either a set of principles which will enable one to predict the kinds of behaviors to be encountered in particular environments, or a set of design guidelines which will make it possible to design environment which will facilitate particular desired types of behavior and perhaps inhibit other undesired types of behavior.

The second environmental principle sees the large-scale environment as a psychological stimulus. In this position the entire environment rather than discrete and separate elements within it is the relevant stimulus for human behavior and experience. This had led to the emergence of new fields of study and the resurgence of

dormant fields such as environmental perception, environmental image and environmental aesthetics, on the one hand, and specific environmentally-related behaviors on the other hand, such as territoriality, crowding, privacy, and the like. The ultimate goal of this line of endeavor is essentially theoretical and is aimed at developing a comprehensive understanding of man's psychological and social responses to the large-scale environment.

Principles Applied to CPTED

It was earlier stated that two assumptions can be identified as underlying CPTED, first, that environments influence behavior and second that environments influence the experiences of individuals in them. It is now apparent that these assumptions can be more precisely and more correctly stated in terms of the operating principles of environment as facilitator and environment as stimulus.

It is therefore clear that CPTED fits directly into the mainstream of work over the past 20 years in the broader area of environment and behavior. It is not some maverick field of investigation, only peripherally or indirectly related, nor is it some esoteric attempt at application of findings derived in relatively

unrelated areas. The two general principles underlying study all in this field have been incorporated as operating assumptions by CPTED. First, it is assumed that environments can be designed in ways that will facilitate behaviors inimicable to crime and inhibit behaviors conducive to crime. A derived hypothesis holds that any design elements that increase an individual's sense of identity and belonging to a particular area contribute to his sense of responsibility for his own and other's behavior in that area, and that providing the opportunity for exercising these responsibilities will lead to behaviors that are inimicable to the performance of criminal acts. As we shall see this is a reasonable approach in the light of other work. This sense of belonging and responsibility probably operates most strongly at the small scale level, that is, the scale of the neighborhood, block or the dwelling unit. In the opposite direction, any environmental aspects that increase the sense of anonymity or of increased pressures and stresses sensed by the individual, with a concomitant restriction of the range of behaviors open to him and of the physical areas seen as relevant to him, may be assumed to produce a general constellation of behaviors more conducive to the conduct of criminal acts.

Moving away from the environment as a facilitator of behavior, toward the environment as a stimulus for experience, two major elements of environmental experience seem particularly relevant, the perception of risk and the perception of control. These, to a certain extent, operate reciprocally. There is a growing body of evidence to suggest that the person who perceives himself as having control over events is more likely to act effectively in any particular situation, and in fact exercise that control or even make a reality out of what was initially a perception of control (Perlmutter and Monty 1977). This of course applies equally to the individual who may experience himself as able to control whether he or others become victims of crime, and to the potential offender who may experience himself as being able to control the outcome of his criminal undertaking. Although the empirical evidence is weak, it may be presumed that the increased sense of control will act to decrease the perception of risk. In any event, it is clear that the perception of risk is an important element in the control of crime. Certainly the potential offender who perceives a high level of risk associated with his act is less likely to carry out the act. The relationship of perceived risk and crime in general by the public is less clear but on theoretical

grounds one could expect, perhaps paradoxically, that the greater the fear of crime, the less the likelihood of effective individual action being taken.

There probably are other both general and more specific instances of the application of principles in the field of environment and behavior to crime prevention through environmental design. The general conclusions, however, would remain unchanged, that first, this field of endeavor is a legitimate and proper member of the general constellation of studies and investigations carried out in the field of environment and behavior, and second, not surprisingly, that the general set of principles adopted by workers in CPTED are directly derived from work in the parent field of environment and behavior.

Status of Basic Principles

It is important and instructive to look at the body of work based upon the two general principles of environmental facilitation and environmental experience in order to evaluate how successful they have been up to now, and how effectively they may serve us as guidelines in the future. A complete and comprehensive survey is far beyond the limits of this paper. Stokols (1977) gives us some idea of the magnitude of such an endeavor. In his forthcoming review of the past five

years of environmental psychology, he lists no fewer than ten textbooks, six edited readers, 30 "state-of-the-art" monographs, along with several hundred specific empirical and theoretical articles yielding a total bibliography of close to 500 items. It is a reflection not on his thoroughness but rather on the impossibility of his task to note that the present writer has detected several emissions from even this gargantuan list. Fortunately, the goal of evaluating the productivity and value of the two underlying principles can probably better be served by a selective and impressionistic look at work in a limited number of areas than by a more complete thorough and systematic coverage of the entire literature.

Studies of the environmental facilitation of behavior tend to be organized around particular types of environments, and most usually around particular kinds of institutional environments. We can choose two of these, hospitals and housing, as broadly representative of the kind of work carried out and indicative of both the values and the shortcomings of contemporary approaches.

The modern era of studies of environment and behavior, as we have seen, started with the mental hospital, and quickly expanded to include the general

hospital as well. How successful has this work been?

One possible indication is to compare contemporary hospital design with that of 20 or so years ago. The change is rather dramatic and striking. From the overall configuration of the spaces, to such specific details as the type of rooms provided, their relationship to each other, the nature and function of the nursing station, and a variety of details, one sees an all-pervasive interest in the behavioral consequences of these design decisions. In very important ways hospitals today simply are not designed the way they were a quarter of a century ago. It would be both presumptuous and probably false to claim that these changes have come about entirely as the result of work in the general area of environment and behavior. However, in that area in connection with hospital design has been within and contributing to the mainstream of developments in that field. From this perspective we must therefore consider that group of studies a success in some general sense.

However, it is also true that there has been developing a direction of thinking which throws into question the continuing utility of studies in the direction of those in the past. As one example out of many, we can look at the report of the section on Psychiatry and Architecture at the 19th International Hospital

Congress in 1975 (1976). Out of seven papers presented, only two can even remotely be considered to represent the standard approach to relationships between the environment and behavior, which has been characteristic of work in the past 20 years. The remaining papers are broadly theoretical and are concerned one way or another with the larger questions of the role of the environment in human health and well being. This conference is thus indicative of a trend away from the concept of treatment of illness and toward the concept of facilitation of health. The "Hospital" which changes its name to "Health Care Facility" is thus symbolic of a very basic underlying attitudinal and philosophical change. Emphasis on the promotion of health and the prevention of illness, perhaps more properly called primary prevention (cf. Kessler and Albee 1975) coupled with evidence that most of the psychological and physical ills of today are environmentally related, throws into question the utility of an approach which looks for specific environments which facilitate specific kinds of behaviors. Studies along this line have certainly contributed to the development of this new and emerging type of approach to health care and in that way may have contributed to their own demise. There is considerable reason to question whether contemporary approaches to prevention and

treatment of illness with their deep environmental commitments can adequately be served by the research principles of the past 20 years.

Although studies of CPTED are not as mature as hospital research, it is reasonable to ask if they may not be following the same historical path. Starting with some very specific direction of environmental facilitation (e.g., surveillance) this work is already having some influence on a variety of design issues. At the same time, if the hospital research is any indication, research in CPTED may be expected to reveal progressively deeper layers of environmental influence which ultimately will lead to a better understanding of the fundamental environmental roots of criminal behavior. At this point, the emphasis on environmental facilitation of isolated and discrete behaviors will come to be seen as unrealistically superficial, and interest may well focus on broader environmental approaches to "primary prevention" of crime. This sequence of course is not inevitable, but the history of hospital research tells us that we may be wise to anticipate it.

The topic of housing, and studies of environmental facilitation of behavior in relation to housing, offers a somewhat different history from the preceding. The most significant changes brought about by studies in

this area are probably related to broad gauge policy issues and large scale decisions rather than specific environmental components and limited types of behavior. Some of the most important contributions of housing studies have by now become classic parts of the literature. The importance of maintaining established neighborhood patterns of living, and the psychological and social dangers inherent in interfering with these patterns, have become so firmly recognized and so strongly embedded in our everyday thinking that we sometimes forget that these principles are products of the past 20 years. The importance of behavioral criteria in large scale housing decisions unfortunately had to be first demonstrated through massive and sometimes devastating failures, of which Pruitt-Igoe has become the symbol. However, other equally important but perhaps less dramatic issues have also gradually been clarified in the course of 20 years of research. For example, the importance of management policies in public housing has been shown, as in Bechtel's (1972) study showing that management policies can bring about a self-perpetuating sense of dependency on the part of the occupants. These and other accomplishments are important products of research in the field of environment and behavior, and it is probably correct and fair to give that research major credit for their emergence.

However, when we move from the field of general policy to the specific design of housing units, far less change and far less of a contribution by environment and behavior studies is manifested. Perhaps the most dramatic and widespread change in housing design, the mobile home, has been grossly neglected as a subject for research. Other aspects of housing design in general have not seen anything like the transformation that is evident in other fields. Indeed it is probably fair to say that the majority of changes in housing design have been in response to economic pressures rather than to behavioral or any other kind of research.

In the context of this paper, it is important to note that the concept of defensible space as introduced by Newman stands in a unique position somewhat contradictory to this conclusion. Defensible space clearly stands in the tradition of the concept of environmental facilitation, representative of studies over the past 20 years. It is explicitly an attempt to design housing environments which will facilitate a particular type of behavior on the part of the occupants.

However, in spite of this and a few other notable exceptions, the current trend in approaches to the relationship between housing and behavior seems to be moving in directions away from the application of the limited

principle of environmental facilitation, towards some new and broader theoretical approach. For example, the general concept of what might be called the natural history of an environment has received considerable support in the area of housing studies. By this concept is simply meant the notion that neither environments nor behaviors nor the relationship between them can be considered as static entities. Environment-behavior relationships change, modify and develop over time, and understanding or specifying that relationship at any given moment in time is an arbitrary and in many cases meaningless slice out of an ongoing process of change. Within housing this general approach has led to at least two very important and influential movements. One, the trend toward life cycle costing, is certainly not a product of environment-behavior studies in housing, but it has received important support and impetus from those studies. It is likely to have broad and far-reaching effects on the entire housing design field. A second trend, again not limited to housing but very strongly if not completely influenced by environmental behavior studies, is the growing interest in post-occupancy evaluation. From virtually zero 20 years ago, this field of study has grown dramatically until in a recent survey Bechtel (1978) has reported over 1300 separate post-occupancy studies of housing. Although

this is an impressive number it must certainly be considered as the beginning of what will ultimately become a much greater and even more influential effort. The significant conclusion from the field of housing must be that the model of environmental facilitation is losing whatever specific validity it had in that area and new principles and new approaches are emerging and must be developed.

The studies of environmental facilitation tend to be, as we have noted, aimed at particular environments and particular kinds of behavior. Other settings besides those of hospitals and housing could have been selected. The overall picture, however, would not be changed. The ultimate aim of this type of study is, as indicated earlier, the development of a set of principles enabling us to predict behavior in particular settings and a set of design guidelines enabling us to design environments for particular behaviors. Perhaps nowhere is this more explicitly stated than in the area of CPTED.

A number of efforts to provide such design guidelines for architects and other designers have been made. This is sometimes seen as an attempt to provide applications of diverse research findings in terms of design generalizations. "Bridging the applicability gap" is a catch phrase sometimes heard in this context,

but strictly speaking this is probably not the correct view. The concept of environmental facilitation typically involves, as one of its research products, the discovery of design principles and their relationship to particular behaviors in particular environmental settings rather than applying broad behavioral principles discovered in another context. In any event, a number of books (e.g., Canter and Lee 1974, Lang et al. 1974, Zeisel 1975) have been offered in this connection. It is fair to say that the venture has not been particularly successful. Designers in general do not find in them the kind of immediate, practical formulae that they need in order to make designing for behavior analogous to, let us say, designing for structural integrity. This type of goal, although frequently implicitly or explicitly stated, is probably not a valid one even to aim for, but nevertheless valid generalizations concerning design and behavior relationships are very few. Most workers in the field continue to believe that ad hoc studies of each specific situation still represent the most adequate way of getting the necessary behavioral information. What this all adds up to, in summary of 20 years of studies of environmental facilitation, is that a large and important body of useful and valid knowledge has been accumulated, some important and far

reaching effects have been brought about, but the number of useable and valid generalizations remains severely limited. If this conclusion is true for studies of environment and behavior in general, it is also true for that subset of studies under CPTED.

The second major principle underlying work in environment and behavior, after the environment as facilitator of behavior, has been labeled the environment as stimulus for experience, of which the CPTED principle of motivation reinforcement can be seen as a special case. This general principle has led to work in two major areas, one having to do with environmental perception, meanings, and images, and the other with more particular ways of experiencing environments in terms of concepts such as privacy, crowding and territoriality. We shall look at these two aspects separately.

Environmental perception as it has come to be treated in the literature of environment and behavior has developed a wider range of definitions than is customary in the more traditional studies of perception. This has been accompanied by a wider and more varied methodology (Whyte 1977). Environmental perception, in fact, subsumes not only traditional perception, but also imagery, meaning, valuation and affect. Each of these aspects has important relevance not only for the

general study of environment and behavior, but also to the more specific issues involved in crime prevention. Environmental imagery or "cognitive maps" have generally come to be recognized as the ways in which we cognize large-scale environments in terms of their spatial relationships (Downs and Stea 1973, 1977). Environmental valuation has been used largely as a way of assessing people's environmental preferences and singling out those environments which attract particular individuals and those which either are neutral or repel them (Craik and Zuhe 1976). This in turn is very closely related to aspects of the affective response to environments and questions of environmental aesthetics (Wohlwill 1976).

The specific issue of the perception of environmental risk has been treated as a special topic and has direct relevance to issues of crime prevention. "Some tentative conclusions may be reached about perception of urban risk. The awareness of risk is a common, constant part of the urban dweller's experience, ranging from the possibility of simple annoyances, to loss of property, invasion of one's home and person, to violence and even death. The urban dweller develops strategies for coping with these perceived risks, by restricting the options he sees open to him, and by developing a pattern of action based on these options. By the

expenditure of considerable effort, and by imposing limits on his choice of actions, the urban dweller develops a way of life which he perceives as relatively free of risks for himself, without altering his perception of the generalized risks of the urban scene" (Ittelson 1978).

Environmental meanings associated with particular environmental elements also constitute a major area of environmental perception. Although virtually all aspects of environment have been studied in terms of meanings, probably the most extensive and certainly the most relevant are those having to do with the neighborhood and home. Jane Jacobs' familiar pictures of the urban neighborhood, the block and the sidewalk, for example, are more than descriptions of behavior, they are related to very deeply seated patterns of meaning of those areas to the individuals who lived there. Other studies of neighborhood tend to confirm the general picture that the neighborhood, however it may be defined by the individual, takes on a constellation of important personal meanings. This becomes particularly salient when we move to the level of the house. Cooper's well known work on the house as symbol of self, suggesting along with others that the house expresses both to the outside world and to ourselves a desired self-image, has been amplified by the work of Hayward (1976) on the

constellation of meanings associated with home. It is interesting to note that Hayward found that the home as a physical place occupied a rather low place in the hierarchy of meanings, although this finding has not been generalized beyond the middle class urbanites of Hayward's sample.

All aspects of environmental perception and cognition, imagery, meanings, aesthetics, values, affect and probably others yet to be identified, combine in ways that are not yet clear into the general sense or experience of environmental quality. While the definition of environmental quality is still in its formative stage, the reality of the concept is generally recognized and has important relevance for any attempt at environmental intervention. Any attempt to design or alter environments in order to facilitate particular kinds of behaviors must also take into account the consequences for perceived environmental quality. It may be assumed that behavioral gains (e.g., lower crime rate) made at the expense of environmental quality (e.g., living in a fortress) are no gains at all. The problem for the environmental designer then is seen as producing environments which will at the same time both facilitate particular kinds of behaviors and serve as stimuli for the experience of improved environmental quality.

The environment as a stimulus for the experience of crowding has received growing attention in recent years. A continuing number of articles and a growing number of books explore many aspects of urban crowding in particular (Baum and Epstein 1977, Booth 1976, Freedman 1975). The exact specification of what is meant by crowding, however, continues to be a matter of debate. Is it numbers of people or density? Is it in the environmental stimulus or is it in the psychological response? Does it vary with the task and situation? These and a host of other questions remain open for discussion in the literature. However, with very few exceptions, there seems to be a general consensus that the experience of crowding, when it occurs, has mostly negative or detrimental effects. Crowding, stress and the experience of deteriorating environmental quality seem to go hand in hand. As many authors have noted, privacy and territoriality seem to be part of the general constellation of concepts of which crowding also forms a part (e.g., Altman 1975). Theoretical and empirical studies abound, and any summary will do injustice to most. However, if there is a general thread running through all this work, it seems to be the twin concepts of control and choice. Privacy has something to do with the ability to choose and control interactions

with other individuals; territoriality deals with choosing and controlling particular areas of space, and crowding has to do with violations of one or the other or both of these aspects of choice and control.

This very brief look at some of the ways in which the role of the large scale environment as a psychological stimulus has been studied and conceptualized does not begin to exhaust the range of work already accomplished nor the possibilities of future work in this rapidly expanding area of study. Recognition of the psychological significance of the large-scale environment stands as one of the major contributions of the work in environment and behavior. If this endeavor is far from complete, it is simply a reflection of the magnitude of the task of incorporating the large-scale environment into a psychology which has so long ignored and neglected it.

Current Status of Environment-Behavior Studies

What, in summary, can one say about the large body of work done in the past 20 years in the general field of environment and behavior, work oriented as we have seen around the two major principles of the environmental facilitation of behavior and the environment as psychological stimulus? The answer to this question is

more than academic interest to those concerned with crime prevention. Insofar as the basic principles of crime prevention through environmental design have been shown to be identical with those of studies of environment and behavior in general, so will the ultimate success of CPTED as presently conceived be tied to the success or failure of that larger study.

Perhaps the most adequate summary would be to state a paradox. Work in environment and behavior has had a tremendous impact on all areas of design and social science, and at the same time it has experienced a limited success. Its impact is clear. One simply cannot think about or talk about a whole range of problems today in ways that were acceptable a short time ago. New problems, new formulations of old problems, and a wide range of new methodologies have become an accepted and necessary part of everyday thinking among professionals in a variety of fields. It has become almost second nature to think of the environment and environmental design in connection with almost any psychological or behavioral issue. And at the same time, it is equally unavoidable to think of behavioral issues when faced with any design problem. These are important, widespread and irreversible contributions of the study of environment and behavior. Nevertheless, we cannot

claim very great success in solving many of the problems which have been posed by this new way of thinking. Perhaps this is simply a question of time. After all, the field is new and the problems are difficult. If, for example, we do not yet know everything necessary in order to prevent crime through environmental design, this may simply be a reflection of the fact that the study is new and knowledge slow to accumulate. There is much to be said for this position. There is no doubt that a body of useful knowledge has been accumulated which can be applied to that and other types of problems.

On the other hand, there is probably also a more deep and underlying issue involved in the relative lack of success of studies of environment and behavior in solving particular problems. Work in this field has tended toward atheoretical, empirical studies whose greatest generality can be obtained through empirical generalizations. What theory there is has been either imperfectly developed as yet, or transferred with rather limited success from theories developed in other areas of study. And yet if the history and theory of science tells us anything, it tells us that the empirical generalization is an extremely weak and limited tool, whereas the adequate and well worked out theory is the main tool of scientific advance. Of course, studies

of environment and behavior share to varying degrees the theoretical underpinnings common to other areas of the social sciences and the design field. The great promise of this new approach is that it may offer the direction to a theoretical synthesis which has not been available until the present.

The shortcomings of the study of environment and behavior are also the shortcomings of attempts at crime prevention through environmental design. We have seen that these shortcomings are essentially of a theoretical nature. They show up first in a general inadequacy of the principle of environmental facilitation to be able to cope with the range of issues at which it is aimed. Environmental facilitation by its very nature assumes specific environmental designs aimed at facilitating specific types of behaviors, but both environments and behaviors tend to be global, and holistic, rather than diverse and atomistic. As we have seen in the development of health facilities and in the study of housing, as two examples, the limited concept of environmental facilitation simply proves inadequate to the issues as they emerge out of the study. The study of health facilities has inevitably found itself drawn into the arena of the role of the environment in the primary prevention of illness, and the study of housing

facilities has inevitably found itself drawn into the question of longitudinal studies covering long ranges of time. Similarly, one can predict that one measure of success of attempts at prevention of crime through environmental design by manipulating a limited range of environmental opportunities and risks will be the extent to which this is seen as an inadequate formulation of the problem. The need for extension into environmental control at the prevention level as well as the investigation of longitudinal effects will inevitably become a more salient part of this endeavor.

Whether applied to crime prevention or to any other aspect of environment and behavior, the foregoing considerations point to the necessity for the development of a different theoretical approach, or at least an extension of the two principles which have guided work over the past two decades. Clearly one can only take a wide overview of the field and suggest what seem to be fruitful directions for the development of a theory of environment and behavior. The concluding comments of this paper will briefly consider that question.

It may be fruitful to take as our starting point the very general principles, or view of mankind, suggested as the intellectual roots of environmental

psychology. These principles, as we have seen, hold first, that human beings are necessarily and primarily part of the world and of nature and second, that within the world of which it is a constituent part, humanity plays a unique role which gives it responsibility for both its own and nature's destiny. It is clear from what we have seen that this grand view of mankind as part of and central to the natural environmental processes of our planet is but poorly represented in current studies of environment and behavior. It has already been suggested that this is a consequence of the adoption of the operating principles of environmental facilitation and environment as stimulus. It is not that these principles are wrong, but rather that they are incomplete representations of a larger and more complex process.

If we look at man in action as part of the natural environment rather than outside it and acting on it, a somewhat different perspective emerges. The scientist, as himself man in action, cannot stand outside this process in order to understand it. However, he can as scientist abstract from the process in many different ways, some of which are more likely to be fruitful than others. Perhaps the most general level of abstraction is to see a reciprocal relationship in which man alters his environment and the environment

in turn alters man. The key points to be stressed are that it is a reciprocal relationship with no starting or ending point and that no one direction of effect is more important or has a higher priority than the other. The elements and the directions of effect (i.e., environment on man or man on environment) are abstractions from a unitary process in which they do not have a real existence that transcends their nature or abstractions. When man alters the environment, he simultaneously and as a very part of that act alters himself; when the environment changes, man is also changed as part of the very process of environmental change itself. Nevertheless, if these precautions are kept in mind, it is undoubtedly useful to look upon a person-environment system as the basic unit of analysis. Within this system individuals and groups experience the environment in particular ways, and act on the environment in ways intended to change (or maintain) the nature of that experience in desired directions.

This process can be seen to operate at all levels of scale. The individual in his own intimate surroundings exercises a direct and personal control over his environment, he in fact "personalizes" it in ways intended to enhance and reinforce his own sense of well-being. But the same process operates at the other end

of the scale when large social groupings join together to bring about massive technological environmental manipulation. The separation of human goals from technological action is a recent historical development and one which a proper science of environment and behavior can help to reverse.

In this perspective we can now see why the principles of environmental facilitation and environment as stimulus have proved inadequate. They have abstracted out and concentrated on only one aspect of the process, that of the effect of the environment on man. In doing so, and by treating this aspect as if it were the entire story, they have distorted the total process to such an extent as to make it unrecognizable and unintelligible. To be sure, the role of the effect of man on his environment has been generally neglected in the behavioral sciences. In its own neglect of this topic, the study of environment and behavior has only followed in that tradition.

However, at the same time the study of environment and behavior has paradoxically always had within it the seeds of intellectual revolution capable of overthrowing that limited and traditional approach. Insofar as this study has been concerned with environmental design aimed at influencing behavior, it has indirectly

approached this potential. That it has not been fully realized grows out of the fact that this aspect has been seen as a product of other research, an "application" of behavioral research to design, rather than as a basis aspect of the process under study. It is precisely here that the study of crime prevention through environment design can perhaps make its major contribution. If it can formulate its problem within the general theoretical assumptions that give man the responsibility for his own and nature's future through the exercise of his capacity for environmental manipulation, it has the potential not only of solving its own problem but also of creating a new paradigm for a new generation of studies in environment and behavior.

Summary

Environmental design approaches to crime prevention have been placed in the general context of the larger study of environment-behavior relationships. They stem from the same intellectual roots use the same operating principles and have essentially the same research and applied goals. CPTED thus represents a subset of the field of environment and behavior and can be expected to experience the same successes and share the same limitations as the parent field. The successes have been many and the limitations are real. It is

suggested that fully exploiting the opportunities offered by current approaches, CPTED may well recognize their limits in planning for future work.

REFERENCES

- Altman, I. (1975) The Environment and Social Behavior. Brooks-Cole.
- Baker, A., Davies, R., and Sivadon, P. (1958) Psychiatric Services and Architecture. Geneva: World Health Organization.
- Baum, A. and Epstein, Y. (eds.) (1977) Human Response to Crowding. Erlbaum.
- Bechtel, R. (1972) Dependency, an unintended result of public housing policy. Symposium on Mental Health and Housing, University of Maryland College of Architecture.
- Bechtel, R. (1978) Final Report: Post Occupancy Evaluation Study, HUD, H-2405, March.
- Booth, A. (1976) Urban Crowding and Its Consequences. Praeger.
- Broadly, M. (1968) Planning for People. London: Bedford Square Press.
- Canter, D. and Lee, T. (eds.) (1974) Psychology and the Built Environment. Halstead.
- Craik, K. H. and Zube, E. H. (eds) (1976) Perceiving Environmental Quality. Plenum.
- Downs, R. M. and Stea, D. (eds.) (1973) Image and Environment. Aldine.
- Dubos, R. (1965) Man Adapting. Yale University Press.
- Freedman, J. L. (1975) Crowding and Behavior. Freeman.
- Hayward, D. G. (1977) Psychological Concepts of Home. Unpublished Doctoral Dissertation, City University of New York.
- Ittelson, W. H. (1978) Environmental Perception and Urban Experience, Environment and Behavior (in press).

- Kessler, M. and Albee, G. (1975) Primary Prevention, in Annual Review of Psychology, Vol. 26, 557-592.
- Lang, J., Burnette, C., Moleski, W., and Vachon, D. (eds.) (1974) Designing for Human Behavior. Dowden, Hutchinson and Ross.
- Nineteenth International Hospital Congress Report (1976) World Hospitals, 12, 52-80.
- Osmond, H. (1957) Function as the basis of psychiatric word design, Mental Hospitals, 8, 23-30.
- Perlmutter, L. C. and Monty, R. A. (1977) The importance of perceived control, Amer. Sci., 65, 6, 759-765.
- Stokols, D. (1978) Environmental Psychology, in Annual Review of Psychology, Vol. 29 (in press).
- Tien, J. M., Reppetto, T. A. and Hanes, L. F. (1976) Elements of CPTED. Westinghouse.
- Whyte, A. (1977) Guidelines for Field Studies in Environmental Perception, UNESCO, MAB Technical Note No. 6.
- Wohlwill, J. F. (1976) Environmental Aesthetics, in I. Altman and J. Wohlwill, Human Behavior and Environment, Vol. 1, Plenum
- Zeisel, J. (1975) Sociology and Architectural Design. Russel Sage.

MOTIVATION

A particular behavior is imbedded in both a physical and psychological context. The physical context includes not only the physical environment but also the physical characteristics of the organism. These characteristics might be labelled capabilities and limitations. The psychological environment is an intraindividual phenomenon including but not limited to the history of the organism, characteristic perceptual patterns, expectations, values, etc. Inevitably, there are also interactions between the physical and psychological environments. The field theories of people like Lewin (1937) and Vroom (1964) adequately represent these multiple determinants in single units of behavior.

Nevertheless, even though one has accepted multiple determinism as implied by field theoretic approaches, there are still a large number of questions to be answered relative to both the identity of the variables in the physical and psychological environment and the manner in which these variables interact and coact to yield behavior units. Hypotheses concerning the identity and interactive characteristics of these variables would loosely form the area called motivation. A more formal definition might be as follows: motivation concerns the conditions responsible for variations in the intensity, quality, and direction of ongoing behavior (Vinacke, 1962). Thus, the conditions which are hypothesized to affect the intensity, quality, and/or direction of ongoing behavior are the major sources of variation among theories of motivation. This definition is a rather broad one and leads one to ask what kinds of behavior would not be classified as motivated. In truth, there are very few

behaviors which are not affected by the motivation level of the organism. Two classes which might be excluded from consideration are habits and reflexes. As we shall see in later sections, the variables which comprise the construct motivation vary from theory to theory. In addition, the importance of motivational variables in the range of behaviors exhibited by individuals also varies from theory to theory.

In this chapter, we will attempt to identify motivational theories and approaches which are most appropriate to the study of criminal behavior. More specifically, we will examine the feasibility of environmental intervention in the elimination and/or control of criminal behavior. We will first examine some general classes of motivational theory as well as examples of those classes. Next, we will examine the similarities and dissimilarities of these approaches. Finally, we will examine the way in which each of the approaches might be used to deal with the problem of crime prevention and control through environmental intervention.

Parametric Considerations of Motivation Theories

There are many alternative parameters which might be used to make distinctions among motivation theories. For example, one might use the types or numbers of variables in some causal chain as an index of differentiation. These differences can be thought of as phenotypic variations - differences in appearance rather than structure. On the other hand, there are at least two genotypic (structural) parameters which might be used to differentiate among motivational approaches. These two genotypic parameters are theory content and theory process. This distinction was introduced by Campbell,

Dunnette, Lawler, and Weick (1970) as a heuristic device for comparing and contrasting theories of motivation. By examining the content and process aspects, we are able to differentiate the strengths and weaknesses of various approaches. The content aspect of a theory emphasizes why behavior occurs. The process aspect emphasizes how behavior occurs. Two theories which might help the reader see this distinction are Piaget's theory of intellectual development and Freud's personality theory. In Piaget's theory, it is hypothesized that the child, in the course of maturation, encounters more and more information which must be processed. Unprocessed information somehow causes pain, discomfort, and insecurity. Piaget's propositions concerning the result of the interaction between child and environment (i.e., tension produced by unprocessed information) form the content portion of his theory. He has labelled this concept "Equilibration." Once tension exists in the form of unprocessed information, the child engages in some operation which will be directed toward processing the information. The operation can be described by a set of rules and actions which become progressively abstract as the child develops. An example of such a set of operations would be Piaget's concept of "Accommodation." In the accommodation process, new information is incorporated by means of forming new concepts to deal with it. This concept of accommodation represents a process, a series of actions with certain inevitable consequences.

As another example, consider Freud's distinction between Libido and defense mechanisms. Libidinal energy was considered to be a central force in behavior. It represents, in conjunction with the concepts of the Id, Ego, and Superego, the content of Freud's theory of

personality. Defense mechanisms on the other hand were rather mechanical procedures which one might use to dispel uncomfortable tension. They were thought to work in consistent patterns. In short, they represented at least one of the process components of Freud's theory.

In the next section, we will examine several basic motivational approaches in terms of their content and process propositions in the hope that we might be able to identify those approaches which lend themselves most immediately to the consideration of criminal behavior and its modification.

Reinforcement Theory

The reinforcement approaches are often referred to as "environmentalist" positions. The implication is that motivated or directed behavior is a result of environmental manipulation or intervention. There are three basic elements to the system: stimulus, response, and reinforcement or reward. The logic is simple and has been formalized as the "law of effect": a behavior which is reinforced has a higher probability of occurring again than one which is not reinforced. This proposition rather clearly identifies the central role of the reinforcement process.

As we will see in later sections, the role of response/reward contingency in behavior is an integral part of most theories of motivation, regardless of whether the mechanism is explicit or implied. In, ^{THAT} there are many variations on this simple response/reinforcement theme, there are some rather elaborate hypothetico/deductive theories. Examples of these would be the work of Hull and Spence in the period from 1940-1955. There are some traditional inductive frameworks such as Skinners, based primarily on the observed impact of a

particular environmental manipulation, such as the schedule of reinforcement. In addition, there are some novel inductive approaches based on stochastic processes. An example of this type of approach would be Premack's principle which suggests that the reinforcement process may be defined in terms of the interaction of high probability and low probability behaviors (1965).

Most reinforcement approaches emphasize process propositions. In spite of that, there is an implied content component in the law of effect. The implication is that something in the response/reward association is pleasing to the organism. This pleasure might be thought of as an emotion in humans - a psychophysiological state. Thus, by extension and implication, the reinforcement approach proposes that individuals engage in particular activities to maximize pleasure and minimize pain. This is a rather glib and somewhat exaggerated statement of the role of hedonic mechanisms in behavior but it makes the point that even theories which are billed as "process theories" have content implications.

The most well documented and articulate proponent of the reinforcement approach has been B. F. Skinner. Skinner has emphasized the role of reinforcement schedule on behavior. This emphasis has been extended to include the concept of stimulus control such that once a reinforcer has been identified, the rate of presentation of that reinforcer (response/reward contingency) will determine the degree to which the "experimenter" or environmental agent can maintain control over the organism. This principle has been broadened to a more general concept known as stimulus control (Terrace, 1966). In this broadened framework, the question becomes "how can the

organism be brought under the control of a discriminative stimulus?" The answer to that question implies actions on the part of the environment (or the environmental agent), including but not limited to the manipulation of reinforcement schedules.

In summary, the process components of reinforcement theory as an approach to motivation would comprise stimulus/response/reward connections. Variations in behavior would be brought about by changing one or more of those interrelationships. Implicit in this approach is the assumption that there are particular environmental elements which have the capacity to produce positive and negative feelings in individuals.

Need Theories

Historically, need theories were based on the mechanisms implied by the more basic physiological drive theories. These drive theories proposed that there were basic, inescapable, drives which required action by the organism. They helped define the organism and were not directly properties of the environment, although the environment did have the capacity to effect the intensity of those drives at any particular time. Hunger and thirst would be examples of basic drives. By definition, the human organism is required to replenish certain substances or perish. The need theories have used that replenishment model as an analogue for proposing psychological drive mechanisms. Thus, need theories propose that individuals are born with certain needs and that these needs must be met for the psychological health of the organism.

Examples of these theories are the propositions of Murray, Maslow, and McClelland. Henry Murray's personology (1938) was based

on the postulate that individuals could be characterized by profiles which represented the salience or importance of certain needs. The Thematic Apperception Test (TAT) was intended to elicit information which enabled the construction of that profile. Others have proposed similar need systems but have implied either a universal salience of needs or a sequential salience of needs. McClelland (1961) implies a universal salience in his theory of Need Achievement. Maslow (1953) implies a sequential salience in his need hierarchy theory.

Historically, need theories have tended to emphasize content over process. They have specified categories of needs which are related to behavior of organisms. Thus, Maslow proposed five categories of needs which were salient to all humans at various points in their psychological development. These categories were physical, security, love, esteem, and self-actualization. McClelland proposed that individuals might be described as responding to one of two needs: the need for achievement or the need to avoid failure. Although need theories have attempted to address the "why" of behavior, both implicitly and explicitly, these theories have also addressed some process considerations. Maslow's theory provides a good example. Maslow's need theory is known as a need hierarchy model. Figure 1 presents the

Insert Figure 1 about here

model schematically. The theory proposes that needs are arranged in a prepotent hierarchy. This means that some needs are more powerful (or prepotent) than others when the competing needs are not fulfilled. Thus, the model suggests that until physical needs are met, security

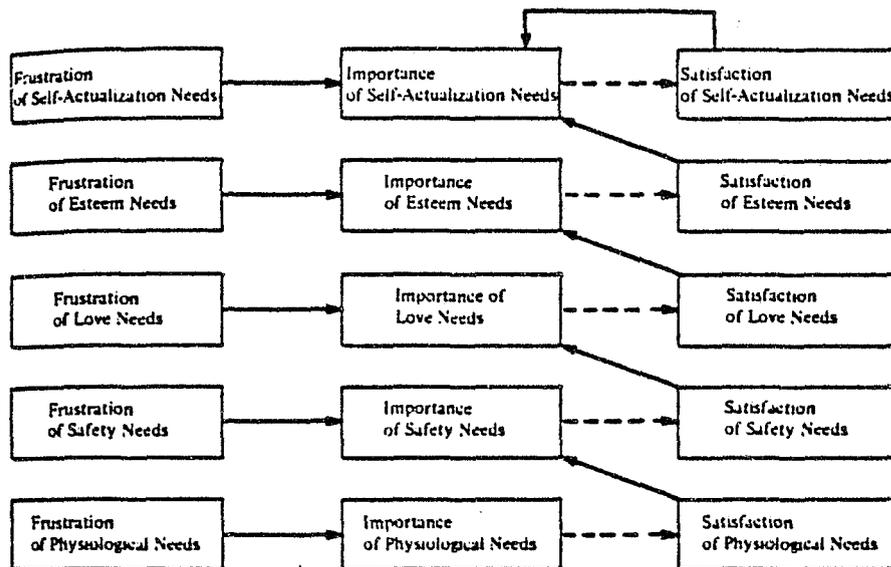
needs will not dramatically effect behavior. Similarly, until love needs are met, elements which might satisfy esteem needs have little effect on behavior. This heirarchical notion might be considered as a process mechanism. The process would be labelled a frustration-progression mechanism. This implies that as long as one need level is not being met (the person's need is being frustrated) environmental elements salient to that need will significantly affect behavior. Once that need has been satisfied or met, the individual will move to the next highest unfilled need. This movement up the heirarchy is the progression part of the mechanism. Thus, if one were to describe the content and process components of Maslow's theory, the content aspect would consist of the five classes of needs while the process aspect would be embodied in the frustration progression mechanism.

Other need theorists have proposed different content. For example, McClelland proposes that the raw material of directed behavior is something called need for achievement. Herzberg (1957) proposes that there are two classes of needs called hygiene needs and motivator needs. In addition, other theorists have suggested other process mechanisms. For example, Alderfer (1967) proposes that there are both frustration-progression and frustration-regression mechanisms working in motivated behavior. Figure 2 presents Alderfer's model schematically.

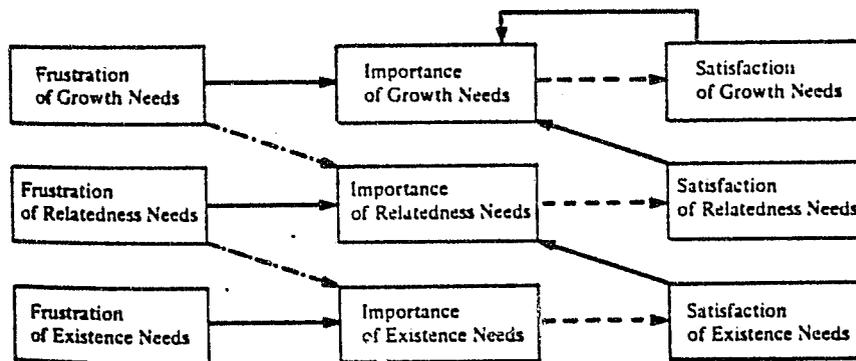
Insert Figure 2 about here

The Alderfer model also suggests a modification in Maslow's content propositions, changing the number of needs from five to three.

Dynamic Properties of Maslow's Model (Fulfillment-Progression)



**Dynamic Properties of Alderfer's Model (Fulfillment-Progression;
Frustration-Regression)**



In the need approaches, motivation is based on some property of an organism at a given time. The emphasis is on the characteristics of the individual rather than the characteristics of the environment. The environment is changed to meet the needs of the individual. At least in the case of Maslow, there is a more articulate presentation of both content and process in the need theories than in the reinforcement approaches. It should be obvious that any attempts to control or modify the behavior of the individual will probably be based on the contingent satisfaction of salient needs. Thus, in some respects, the application of Maslow's theory might be seen as a slightly more sophisticated version of reinforcement theory. This point will be expanded considerably in a later section.

Balance Theories

A third class of theories is based on the proposition that organisms will expend energy in an attempt to maintain some internal homeostatic state. This state has been variously described as physiological (Berlyne, 1967), psychophysiological (Helson, 1964), and cognitive (Festinger, 1957). By far, the most popular approach has been the cognitive one. Festinger (1957) has proposed that discordant cognitions (particularly those representing expectation-reality discrepancies) create tension in the organism. It is further assumed that this tension is unpleasant, and that the organism will expend energy in an attempt to reduce this tension. Conversely, the absence of this tension is more appealing than the tension itself, and organisms will expend energy to maintain conditions which help avoid tension resulting from discordant cognitions. Thus, organisms will be motivated a) to relieve the tension resulting from discordant

cognitions and b) to maintain conditions which are related to the absence of such cognitive discordance (or dissonance). Festinger had some propositions concerning the way in which this tension might be relieved, but his primary contribution was in the content area of motivation.

Other theorists have proposed that a very compelling argument for the notion of cognitive dissonance can be made from an examination of the effects of social comparisons. Homans (1953), Adams (1965), and Jacques (1961) have all proposed that individuals compare their inputs and outcomes in various situations with the inputs and outcomes of "significant others" and use the resulting information in making choices among alternative behavior patterns. They suggest that it is this social comparison which is responsible for the presence or absence of tension in many situations. They further suggest more explicitly than Festinger the ways in which such tension might be relieved. This extension of Festinger's theory has come to be known as Equity theory, and is based philosophically on an organism's application of the principle of distributive justice.

Festinger supplied the content properties of the approach: dissonant cognitions cause discomfort. Others have supplied the process properties of the approach: social comparisons are the raw material for dissonance and dissonance induced tension has systematic effects on behavioral choice. The general theme to Festinger's theory and all balance theories is that homeostasis is pleasant and the absence of homeostasis is unpleasant. In addition, many of the balance theories place great emphasis on cognitive operations. This is in stark contrast with the reinforcement and need theorists who pay little or no attention to cognitive operations.

Instrumentality Theory

The proposed importance of cognitive activities in motivation is most clearly shown in a class of theories known as instrumentality theories. These theories generally include three separate components which combine to explain choice behavior in individuals, and energy expenditure based on choice. The three components are: instrumentality, expectancy, and valence.

We usually decide to engage in a particular activity because we believe that it will provide us with something which we value. This simple statement can be used to describe the three components of instrumentality theory. The perceived relationship between one outcome and another is known as instrumentality. Money is instrumental in obtaining various pleasant experiences; power is instrumental in accumulating money; etc. The perceived relationship between an action and an outcome is known as expectancy. I expect that if I work hard, I will be paid well. I expect that if I marry the boss' son I will accumulate power; etc. The value which various outcomes hold for me (i.e., their ability to attract or repel me) is known as their valence. If outcomes which I value exist in the environment, if I believe that those other outcomes are instrumental in obtaining those valued outcomes, and if I believe that certain actions will lead to achieving those "instrumental" outcomes, the approach suggests that there will be a force on me to engage in those actions.

In the last several years, modifications to the theory have been primarily of the process type. The most complete and articulate version of the current instrumentality approaches is that of Porter and Lawler (1968). Figure 3 presents the major components of the Porter/

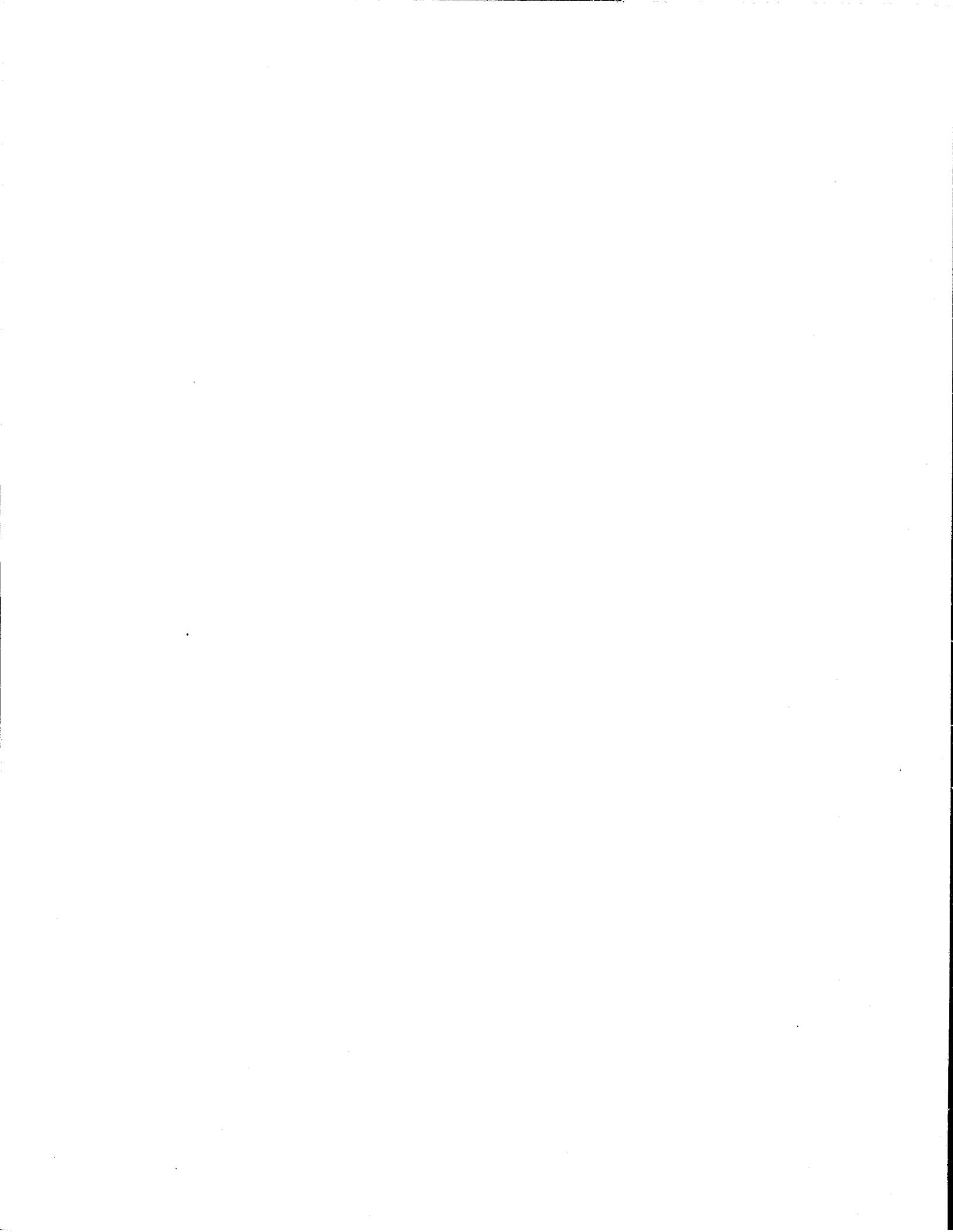
Insert Figure 3 about here

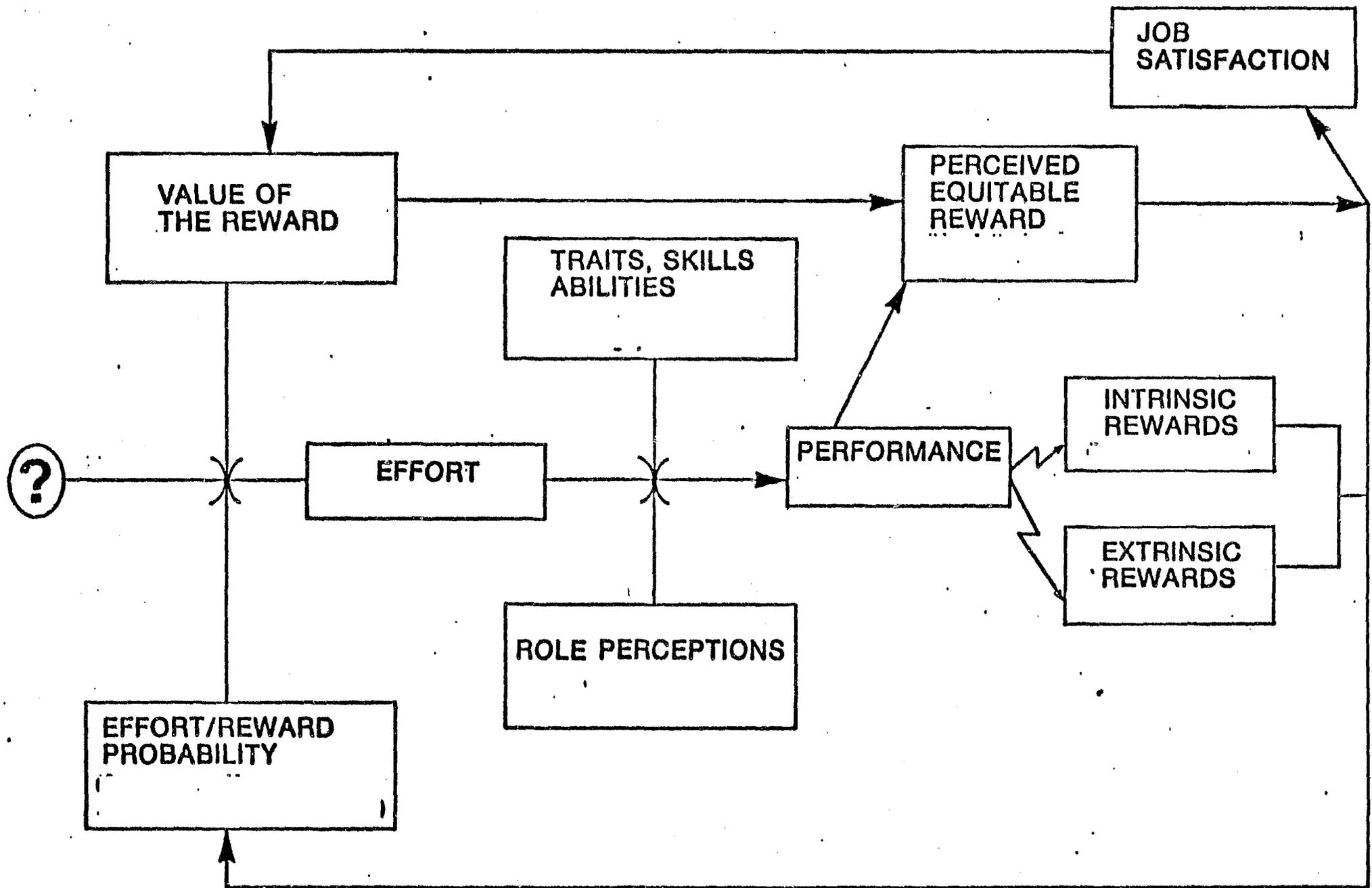
Lawler instrumentality model. These components might be described as follows:

Value of the Reward: this box represents the attractiveness of various rewards which are being promised to the individual. Thus, the person is asking himself the question "are the rewards promised worth the effort required to get them?" In a sense, the individual adds up all of the possible rewards and punishments which might result from a given action.

Perceived Effort-Reward Possibility: this box represents the belief which an individual has that some action or effort expenditure will actually lead to some valued rewards. The question which the individual asks himself would be "what is the probability that if I actually expend the effort or perform the action that rewards will follow?" This is a completely different question from the first one asked concerning the value of the rewards. One can value the rewards which are available but not believe that he will actually get them.

These two components, value of the reward and effort-reward probability, combine to yield some level of effort, i.e., they jointly determine how hard an individual will try. It is important to note that these two values are combined by multiplying them, not by adding them. This means that if either the value of the reward or the probability of the reward is zero, no effort will result. Practically, this means that you cannot compensate for a low probability of reward by increasing the value of the reward.





INSTRUMENTALITY MODEL OF MOTIVATION

FIGURE 3



Effort: this component represents motivation in its most basic sense. It represents how hard the individual will try, not how well the individual will actually perform. The theory proposes that there are at least two other variables which combine with effort to yield performance. These two variables are abilities and role perceptions.

Abilities and Traits: this component refers to the relatively stable characteristics of the individual, such as intelligence, personality characteristics, and physical skills. In a sense, these characteristics set the upper limits for an individual's performance.

Role Perceptions: the role perception is the individual worker's definition of successful performance. This is a critical factor in determining if an individual's effort and skills are transformed into successful performance. If a person is not aware of what is considered successful performance, much of his effort is likely to be wasted. Role perceptions might be thought of as an individual's understanding of the nature of good performance.

We have now reached the point at which the individual is actually performing at some level. The individual has presumably asked himself if the value of the rewards offered is adequate and answered "yes." In addition, the individual has asked himself if a reward is likely to follow effort expenditure and answered "yes." Consequently, the individual has expended some effort, or has "tried." If this effort is accompanied by the necessary skill to perform and an adequate definition of good performance, then good performance should

result. It is then time for the environment to respond to the individual's productive efforts.

Perceived Equitable Reward: this component describes the level of reward which an individual feels is appropriate. It is determined by the individual's perception concerning how well he fits role requirements, his perceptions of how well he actually performs, and his original estimate of the value of the reward. In a sense, when the individual first estimates the value of the reward, he sets up an expectation which will be used to evaluate the adequacy of the actual rewards after performance, thus the arrow from Value of rewards to Perceived equitable rewards. In addition, the arrow from Performance to Perceived Equitable Rewards implies that the individual will adjust this expected reward value to match actual performance. The rewards which an individual actually receives can be classified as either intrinsic or extrinsic rewards.

Intrinsic Rewards: these are rewards which satisfy higher order needs (as defined by Maslow, for example) and administered by the individual to himself rather than by some external agent. An example would be the feeling of accomplishment which an individual gets from completing a difficult or challenging assignment.

Extrinsic Rewards: these are rewards administered by an external agent. Examples of these rewards are money, praise, recognition, etc.

The wavy lines connecting these rewards to performance are meant to imply that rewards do not always follow good performance. In the

case of the intrinsic rewards, this may be because the task was not sufficiently challenging. In the case of the extrinsic rewards this may be because the external agent is unwilling or unable to provide the rewards immediately following successful performance. The evaluation of actual rewards by the individual is crucial in determining future behavior. As you can see by looking at the diagram once again, if no rewards occur, this information feeds back to the effort-reward probability component so that the next time the person asks himself the question "will rewards follow successful performance?" the answer is more likely to be "no!" This, in turn, will reduce the effort which the individual will expend in the future. Conversely, if rewards do occur as expected, the value of the effort-reward probability should increase yielding increasingly greater levels of effort.

What about the amount of the reward? If no rewards or inadequate rewards occur (as determined by the comparison of actual rewards to perceived equitable rewards), dissatisfaction results. This dissatisfaction feeds back to the value of the reward. Thus, the next time the person asks himself the question "are the rewards worth the effort?", the answer will most likely be "no!" This, in turn, will reduce the effort which the individual expends in the future. Conversely, if the actual rewards equal or exceed the anticipated rewards, then a state of satisfaction results. Since the state of satisfaction is thought to be pleasant, it has the effect of increasing the value of the reward, such that the next time the individual asks a question of himself concerning the value of the reward, he is more likely to see it as worthwhile and, consequently, will expend greater effort.

It can be seen that instrumentality is considerably more complex in process than the other approaches. Nevertheless, there is a rather dramatic gap in the content aspects of the theory.

Similarities and Dissimilarities among Motivational Approaches

If we were to evaluate the theories in terms of their process and content components, reinforcement theory would be clearly process, instrumentality theory would be strongly process with a few content propositions, balance theory would be process-oriented with a significant number of content propositions (which would vary as a function of the particular brand of balance theory), and need theory would be strong in content and weak in process propositions. Even though this is a simplistic representation of the relationships among the four approaches, the two parameters of content and process are efficient in helping distinguish among them.

In spite of their differences, a close examination of the approaches reveals more similarities than dissimilarities. Maslow, and many other need theorists, are often described as "humanists." This is presumably because they propose needs that are uniquely human. Humanists are often contrasted with the "behaviorists" in relation to their view of the human organism. In these contrasts, the behaviorists are seen as rather cold, calculating, and unappreciative of the capabilities and limitations of humans vis a' vis "lower" organisms. Nevertheless, if one were to contrast a Maslow-type theory with the propositions of Skinner, one would not find any great difference in process. If anything, Maslow has been somewhat more confining in his propositions concerning what environmental elements are capable of functioning as reinforcers at particular points in

time. As behavioral technicians, need theorists imply operations for "motivating" individuals similar to those of the reinforcement theorists. As far as the content of the two approaches is concerned, the reinforcement theorists take an idiographic approach, allowing reinforcement to be defined intra-individually; the need theorists tend to be more general and normative, defining the properties of reinforcement inter-individually.

The balance theories imply that some organismic imbalance is the major content of directed behavior. The balance theories differ with respect to the operational definition of that imbalance. For example, Helson proposes that individuals develop some intra-individual base rate for stimulation. This base rate has a neural representation and whenever stimulation differs significantly from it, the individual will take steps to accommodate this new level of stimulation. Thus, Helson's imbalance is psychophysiological in nature. In contrast, the dissonance theorists propose that the imbalance is primarily cognitive in nature (even though psychophysiological states such as emotions may result from discrepant cognitions). Nevertheless, as was the case with both the reinforcement theorists and the need theorists, the hedonic overtones are very strong - people will seek pleasure and avoid pain. The definition of pain is somewhat clearer in balance theories than in reinforcement theories, but less clear than the need theorist's definition. The logic of "contingent" impact of environment of behavior is common to all of these approaches.

The fourth approach, instrumentality, is by far the most cognitive and the most elaborate in terms of process. This is particularly true of well developed models, such as the Porter-Lawler model

which appears in Figure 3. The Porter-Lawler model includes not only intra- and inter-individual variables, but also environmental intervention processes and feedback loops. Nevertheless, the model is somewhat less specific concerning content components. Presumably, individuals seek satisfaction in their interactions with the environment. This satisfaction is a derivative variable, depending for its value on the match between expectations and realities. As such, the content component of the Porter-Lawler model is similar to the homeostatic element of most of the balance theories.

In fact, one could use the Porter Lawler model as a general heuristic for combining the most important characteristics of the other three approaches. The connection between performance and rewards, and the feedback loop from rewards to effort/reward probability clearly represents reinforcement theory. The only necessary addition would be an intervening variable between performance and rewards which might be labelled "reward schedule." The definition of intrinsic and extrinsic rewards could be thought of as "higher order needs" in the Maslow framework; conversely, extrinsic rewards might be relabelled, "lower order needs." The relationship between the value of the reward, the perceived equitable reward, performance, and satisfaction is a representation of the critical elements of several variations of balance theory.

In addition to adequately representing the most important elements of the three other approaches, the Porter-Lawler model adds unique operations and variables to the general motivational process. It clearly distinguishes between effort and performance. It also suggests environmental interventions such as the definition of good

performance and training programs directed toward traits, skills, and abilities. Finally, it suggests that the interaction between the value of the reward and the effort-reward probability is multiplicative rather than additive, as implied by many traditional approaches.

While the discussion above suggests that the various theories are not opposed to another, that is not to say that they are interchangeable. As a matter of fact, an examination of them suggests that they may be arranged in a hierarchical structure. Figure 4 graphically

Insert Figure 4 about here

suggests a hypothesized structure for arranging the various approaches in terms of the cognitive development and operations of the "motivatee." This structure suggests that there is no "correct" theory of motivation; rather, one approach may be more effective than another in understanding the behavior of a particular individual. The effectiveness of any one approach or theory will depend on the level of cognitive development of the person being considered. The level of cognitive development is determined, to some degree, by the level and degree of interaction with the relevant environment. The implication of a framework such as this for attempts at modifying behavior through environmental intervention are rather dramatic. It suggests that before one can identify the appropriate model of motivation for anticipating the effects of a particular intervention, one must be able to estimate the level of cognitive development of the "target" of the intervention. More will be said about this in a later section. For the present, suffice it to say that the issue may not be as simple as picking the right theory of motivation.

APPLICATIONS OF THE FOUR MOTIVATIONAL APPROACHES TO CRIME CONTROL

Applications of Traditional Motivational Approaches to Sub-PopulationReinforcement Theory: Offenders

Structurally, reinforcement theory requires three elements for efficient control of behavior: specification of stimulus which is discriminable to the subject; discrete response which can be reliably observed; and a stimulus element labelled a reward or punishment which has some salience for the subject. In offender populations, the experimental paradigm has most often been one of either negative reinforcement or punishment. The offender is asked to "learn" that if a crime is committed, punishment will occur. If a crime does not occur, punishment will be avoided. This, of course, assumes that criminal activity is a prepotent behavior which will occur spontaneously without controlling mechanisms.

There are several problems which confront the reinforcement theorist in attempting to intervene directly in the behavior of offenders using a punishment or negative reinforcement paradigm. The most obvious problem is that of the response. It is difficult to reliably record the occurrence of a response called crime. If aggregate crime statistics "are somewhat unreliable," individual statistics are chaos. If the controlling agent is incapable of recording the response of a single individual, it is doubtful that rewards or punishments can be made "contingent." If rewards or punishments cannot be made contingent, the subject must assume that they are random with relation to his or her behavior, thus, behavior will be unaffected.



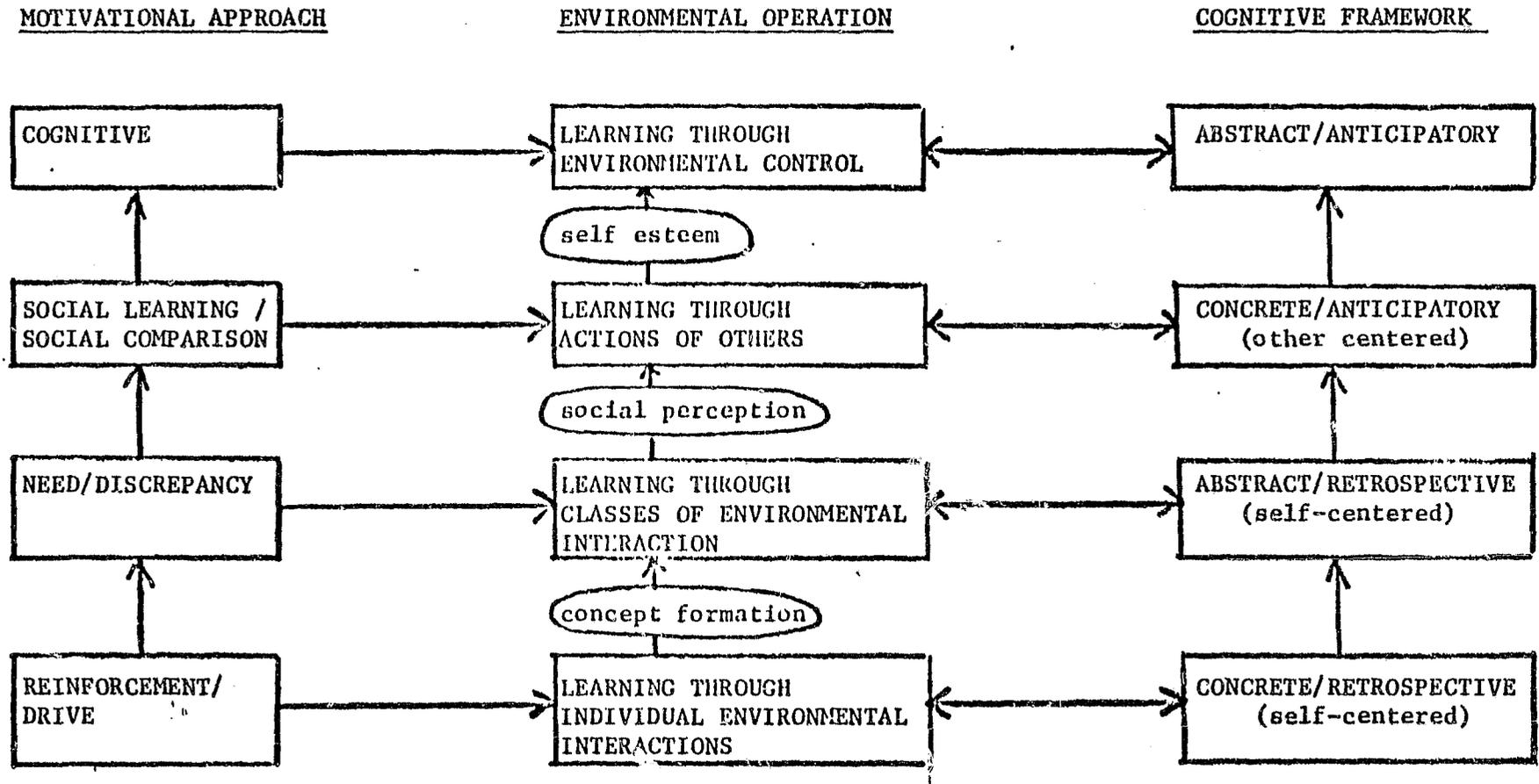


Figure 4: relationships among motivational approaches, level of cognitive activity, and environmental interactions.



The third structural element in the reinforcement paradigm is the reward or punishment. There are two issues involved - contingency and salience. The fact that punishments are non-contingent with respect to criminal behavior is in evidence almost every day in one or another editorial page. The elaborate system of checks and balances built into our judicial system form the lowest level to the Supreme Court works in favor of non-contingency for single offenders. In many context, it is tough to get convicted of particular crimes. Even if convicted, many offenders are able to escape punishment through probation or similar alternatives. Due to the heavy burden of case loads, plea bargaining resulting in milder punishments than "promised" is common. Given the manpower shortages in most municipal law enforcement systems, apprehension is unlikely. In short, the contingency between crime and punishment is a weak one, at least as perceived by potential offenders.

The second issue, salience, is equally problematic. For individuals expecting to spend a significant portion of their life in or around jails, the degree of punishment which incarceration represents is a question. It is not uncommon for jobless youths living in squalor to choose a week or two at a "detention center" rather than their day to day existence. At the very least, this represents a change in environment. Environment change has itself been proposed as a strong reinforcer. Thus, in this case, the controlling agent and the subject are diametrically opposed in their definition of reward and punishment.

A chapter alone could be written on the analysis of criminal activity from the reinforcement approach. Nevertheless, from the

brief description above, it should be apparent that the preconditions for an effective intervention program based on principles of reinforcement have not yet been met in most instances. In addition, one would have to consider multiple reinforcement systems which undoubtedly operate. It is unlikely that the reinforcement system of the controlling agency could hope to match the power of the system operated by peer cultures - other offenders. The peer community offers positive reinforcement in the form of praise, increased status, and pleasures enjoyed by virtue of the fruits of crime. In short, the probability of affecting level or type of criminal behavior by manipulating punishments directed toward individual potential offenders is extremely small.

Reinforcement Theory: Non-Offenders

There are several categories of non-offenders who might be considered. Some of these are: potential victims, inhabitants of high crime areas, and police. We will not deal with police, courts, prisons, etc. There is ample discussion of these subclasses in existing work. If our concern is the control of criminal activity through environmental intervention, it makes sense to focus on those most likely to be in the immediate environment when a crime may occur.

The clearest method for effecting the behavior of potential victims is by specifying the activities on their part which may increase or decrease the probability that they will become a victim. Thus, the identification of high risk areas, high risk times during the day and night, and high risk profiles (ways of dressing and acting), by agencies with responsibilities for crime control all contribute to defining discriminative stimuli, reliable responses, and probable

rewards and punishments. In its most simple form, this is the process of citizen education. The most important aspect of this education is the clear and concise statement of response/punishment contingencies. It would not be terribly difficult to construct systems for the presentation which contrast the probability of rape or robbery for various locations or for various times. These kinds of programs would be directed toward keeping potential victims away from particular areas at particular times. Unfortunately, if deterministic models of criminal activity are valid, this would imply either that the risk to individuals whose presence is demanded in those areas is greatly increased or that the high risk areas would shift with population shifts. If, on the other hand, criminal activity is primarily opportunistic, any decrease in the opportunity for crime (e.g., available victims) should be mirrored in a decrease in actual criminal activity. In these examples, once again the punishment or negative reinforcement paradigm is apparent. Nevertheless, since the stimulus, response, and reinforcement (negative) can be clearly identified, intervention in the activities of potential victims shows some promise.

A second subclass of non-offenders comprises all individuals who might be found in and around areas where crime may occur. A number of studies have implied that crime levels can be suppressed by simply making the presence of large numbers of non-offenders more obvious. The implication is that by increasing the number of individuals per unit-space, the number of bystanders who might intervene and the number of potential witnesses is also increased. In order to accomplish this, one must make the particular area appealing to such individuals. Many major urban areas have accomplished this through

redevelopment and restoration. Examples of such areas are the Oldtown area of Portland, Maine; the Headhouse Square area of Philadelphia; the Georgetown area of Washington, D. C. There are a large number of positive reinforcements available to people for coming to the area.

When the implications of systems for affecting victim presence are combined with the implications for affecting high visibility of intervenors and witnesses, it would seem that there is a critical mass concept involved. Unless a certain level of "occupancy" of an area can be assured, programs to minimize potential victim presence should be instituted.

It would seem that reinforcement approaches would be most appropriate for programs directed toward non-offender groups than offender groups.

Need Theories: Offenders

As mentioned above, Need theories differ primarily in terms of content, i.e., the identity of salient needs. Since Maslow's need heirarchy is one of the better known and articulated frameworks, his model of motivation will be considered as prototypic of the need approaches to the control of criminal behavior.

By accepting Maslow's framework, one implicitly accepts a frustration-progression mechanism, i.e., individuals will expend energy in order to satisfy the lowest unfulfilled need in the heirarchy. Thus, individuals who have not yet satisfied security needs will not be affected by promises of rewards which are appropriate to the satisfaction of a higher level, such as esteem. In terms of offender behavior, one must assume that the behavior is a manifestation of an unfulfilled need somewhere in the heirarchy. This could be

true regardless of whether crime is considered deterministic or opportunistic. The offender sees criminal behavior as the most efficient way to satisfy the particular need. If the offender is successful in satisfying that need through criminal activity, the probability of engaging in criminal activity in order to satisfy needs in the future should increase. In order to decrease the probability of criminal behavior, the offender must see another alternative as a means to satisfying important needs.

An examination of criminal activity reveals that it has the potential for satisfying all of Maslow's proposed needs. The relationship of many criminal acts to physical and security needs is obvious. In addition, money may not insure happiness, but it very often insures companionship, thus satisfying love needs. The social heirarchy of criminals is well known. It is very often structured around a combination of the success of the individual and the nature of the criminal activity in which they engage. Social groups in prisons often form on this basis. Consequently, the fulfillment of esteem needs can be accomplished by criminal behavior. Finally, many crimes which require planning and careful execution have the potential for satisfying self-actualization needs.

In order to effectively compete with criminal activity as a source of need fulfillment, the control agency must know at what need levels potential criminals are functioning. For example, if individuals are stealing food, furniture, clothes, etc., in reasonably small quantities, it should be obvious that physical or security needs are in operation. These individuals must be provided with opportunities to satisfy those needs in more socially acceptable manners. This is,

of course, the underlying philosophy of many welfare programs. Gainful employment is a better alternative because of the possibility of satisfying multiple needs simultaneously, but levels of employment can hardly be arranged to respond to the criminal justice community.

At the other end of the hierarchy, there are many individuals who seem to engage in criminal activity solely for the challenge it represents. These individuals would have to be presented with an alternative opportunity to use valued abilities. An intervention program based on Maslow's propositions and directed toward offenders would require some initial normative research. For example, Figure 5

Insert Figure 5 about here

presents the results of a hypothetical analysis of the need levels of various categories of offenders. Figure 5 suggests that there is no "one" intervention which is capable of addressing or reducing all types of criminal activities. It suggests that programs must be tailored to types of crimes. By extension, communities and municipal agencies must rank crime in order of frequency and/or impact and address programs to those crimes on a priority basis. Thus, gang activities, high levels of group gambling, etc., might suggest the need for increased facilities for social interaction of a more socially desirable nature. High levels of mugging by drug dependent offenders might suggest the institution of methadone programs. High levels of mugging by offenders not dependent on drugs might suggest modified welfare programs. It is not the purpose of this paper to suggest cures or programs. Nevertheless, these examples suggest how a need

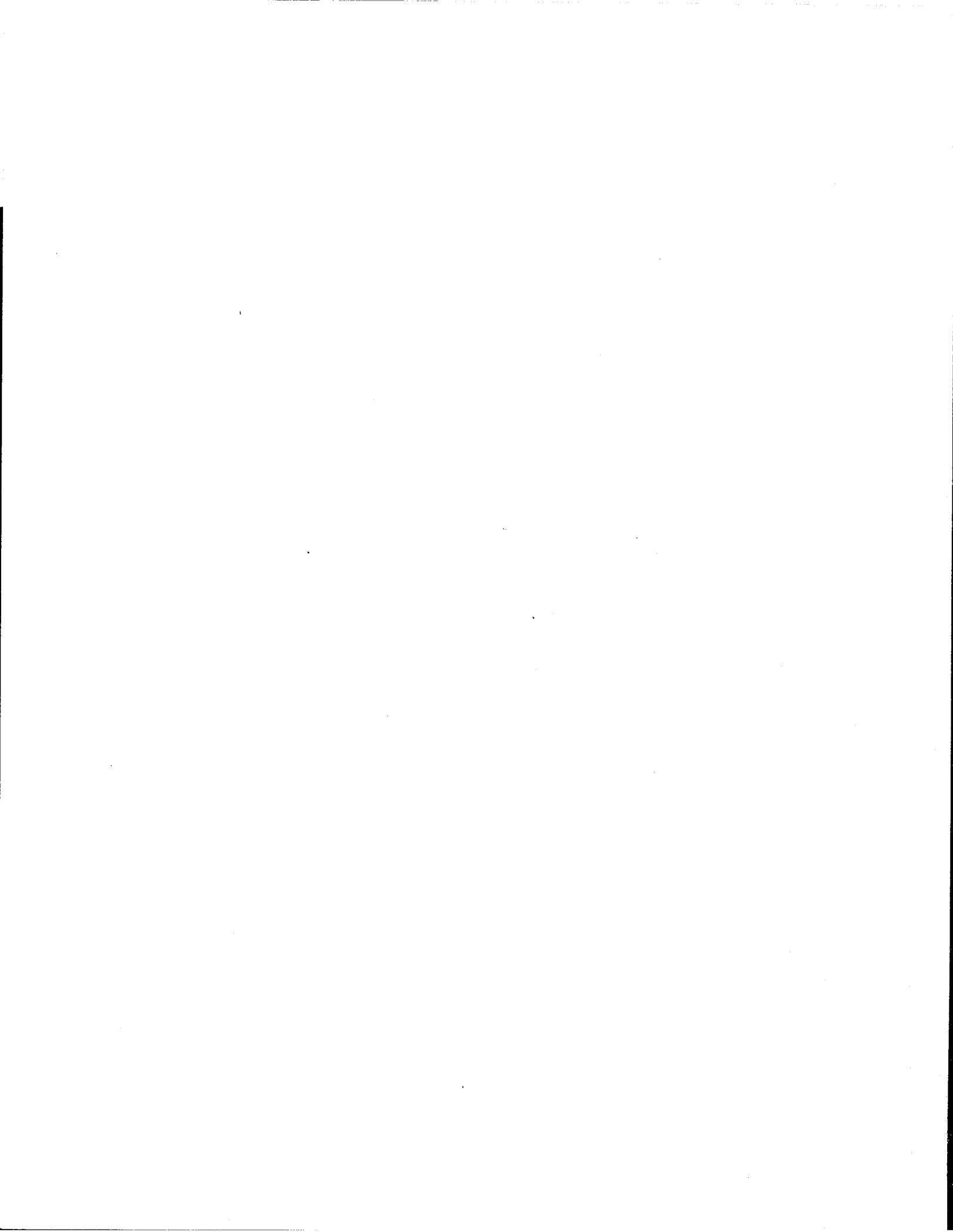


Figure 5: Hypothetical Cross-Tabulation of Need Level by Criminal Activity

<u>Criminal Activity</u>	<u>NEED LEVEL</u>				
	<u>Physical</u>	<u>Security</u>	<u>Love</u>	<u>Esteem</u>	<u>Self-Actualization</u>
Armed Robbery	XXXX				
Mugging	XXXX				
Burglary	XXXX				
Breaking and entering	XXXX				
Drug Abuse	XXXX				
<hr/>					
Embezzlement		XXXX			
Grand Larceny		XXXX			
"White collar" crime		XXXX			
<hr/>					
Pimping			XXXX		
Prostitution			XXXX		
"Gang" related crimes			XXXX		
Gambling			XXXX		
<hr/>					
Bank Robbery (unarmed)			XXXX		
Contract Killing			XXXX		
Arson			XXXX		
<hr/>					
Elaborate extortion schemes				XXXX	
"Confidence" schemes				XXXX	
<hr/>					
Organized crime					XXXX
Long term criminal plans; innovative crime					XXXX

1944-1945

CONTINUED

3 OF 7



approach to motivation might be extended to action programs directed toward offenders.

Need Theories: Non-Offenders

As was the case with the reinforcement approach, it is somewhat easier to conceive of programs directed toward non-offenders rather than offenders. If the goal is one of increasing the number of individuals in a particular geographic area, thus reducing the probability of crime, one would structure that environment such that it provided the opportunity to satisfy one or more of the need categories in the Maslow Hierarchy. One way of doing this might be to encourage industrial organizations who are located in high crime areas to pay a premium for employees who reside in or around that area. Organizations might be given incentives in the form of tax credits to locate and hire from specific areas. There are a number of institutional changes which might be considered. Nevertheless, in spite of the fact that it might be easier to conceive of programs for non-offenders, they must be more amorphous and less direct than those which address offenders. In contrast to the reinforcement approach, if one were to adopt a need approach, it might be more efficient to direct efforts toward offenders.

Balance Theories: Offenders

As indicated earlier, there are several different varieties of balance theory. The most popular of these have been the cognitive dissonance and social exchange theories. Cognitive dissonance theory states that individuals will expend energy either to keep a cognitive system in balance or to correct for an imbalance. If we were to apply this proposition to the behavior of offenders, we might

hypothesize that criminal activity is an attempt by the individual to impose a closer match between expectations and reality. Nevertheless, it is difficult to know why one strategy was chosen over another, i.e., one type of criminal activity rather than another. In terms of specific process statements, cognitive dissonance theory is deficient. One must know rather precisely the nature of the cognitions of the individual in question before any environmental intervention can be suggested.

Social exchange theory implies that individuals define dissonance or consonance on the basis of some comparison between their own inputs and outcomes in a particular system, and the inputs and outcomes of some "significant other" in that system. The most well known version of this type of approach is Equity Theory (Jacques, 1961; Adams, 1955). In terms of the problem at hand, criminal activity, the social exchange approach suggests that the offender has discovered some inequity and is attempting to bring the social exchange system back into balance. For example, the offender might feel that "... everyone else has enough money to enjoy themselves, so why shouldn't I?" Criminal activity is one way of getting enough money to enjoy life "... like everybody else." This strategy would involve increasing outcomes while leaving inputs constant. The individual under consideration might also attempt to reduce inputs while leaving outcomes constant or attempt to modify the input outcome ratio of the "significant other." These latter strategies would be considerably more difficult than simply increasing outcomes. Attempts to control criminal activity using a social exchange approach would involve allowing the potential offender to increase outcomes

through more socially acceptable avenues. Traditionally, these avenues have been work programs of some kind. Unfortunately, work programs would imply an increase in inputs which would put the individual at a perceived disadvantage again. Alternative strategies might be attempts to affect the choice of the "significant other" or educational and instructional program to make the expectations of the potential offender more realistic.

A major problem with the social exchange approaches to motivation is the implication that all energy derives from social phenomena, i.e., interactions with significant others. Unfortunately, a good deal of criminal activity (and behavior, generally), is not a social phenomenon. Thus, there are gaps in understanding behavior which require a more complete and elaborate theory.

Balance Theory: Non-Offenders

Non-offenders present a problem for balance theories. In order to change the direction of their behavior, it would be necessary to identify individuals in inequitable or dissonance-inducing situations and provide an environment with the potential for eliminating the dissonance. Alternatively, one might attempt to create dissonance and offer alternatives for eliminating this dissonance through crime control activities. A number of public interest campaigns have been structured on this premise. As an example of this latter strategy, newspaper and TV ads might suggest that citizens have a responsibility to aid in the control of crime as intervention agents, witnesses, etc. Even a cursory examination of the applicability of variations in balance theory suggests that the feasibility is limited. That is not to imply that the theory is "wrong" in any sense, just less practical than some other approaches.

Instrumentality Theory: Offenders

As was indicated in an earlier section, the process component of the Porter-Lawler model of motivation are probably the best articulated of the recent instrumentality theories. Consequently, the application of instrumentality theory criminal behavior will be based on that model.

In understanding the choices among alternatives made by the offender, Figure XXX suggests that there are several major components: Value of the Reward, Effort Reward Probability, Traits, Skills, and Abilities, Role Perception, Perceived Equitable Reward, and Rewards (intrinsic and extrinsic). The components labelled Effort, Performance, and Satisfaction are primarily derivative variables which depend on the interaction of the other components in the model for their value, thus they cannot be influenced directly. We will deal only with those variables which can be addressed or affected directly by a controlling agent.

The offender clearly sees some value in the criminal activity. In addition, the offender sees greater value in the criminal activity than in any non-criminal alternative. When the value of the reward is considered by the potential offender, punishments are also considered. If one were to attempt to affect the choices made by potential offenders, one way would be to increase dramatically the value of the punishment attached to that activity. Thus, the traditional notion of "stiffer penalties" would fall in this category of intervention.

The effort-reward probability component addresses the belief of the potential offender that the criminal activity will not be punished

and that the rewards will actually result from the activity. Examples of programs directed toward decreasing the effort-reward probability are speedier and more reliable judicial operations and minimum sentencing requirements. In addition, increases in the size of the controlling organization (e.g., police department) and the efficiency of that operation should have similar effects. It is important to remember that these variables (value of the reward, effort-reward probability) are not objectively or normatively determined, they depend on the perception of the individual being considered. Thus, actually increasing the probability of apprehension is irrelevant unless the potential offender perceives the probability of apprehension to have increased. Sealed compartments in taxi-cabs, exact change policies, etc., are all examples of attempts to decrease the effort-reward probability as well.

The model implies that if either the value of the reward, or the effort/reward probability assume zero value, then no effort will be expended. This is based on the hypothesized multiplicative interaction between the two elements. If these two elements do multiply, it is clear that the most direct strategy for controlling agencies is to reduce the value of one of the components to zero.

Traits, skills, and abilities can be considered in one of two ways. One can either consider the skills necessary to effectively engage in the criminal activity, or the skills necessary to engage in alternative activities. One might wish to reduce the former and improve the latter. Technological advances in security equipment is an example of effectively reducing the skill level of the potential offender. Vocational training and counselling programs are an example

of a way to increase socially desirable skill levels. One might also consider attempts to intervene at the level of personality traits. For example, it has been proposed that many offenders are higher on external locus of control measures than non-offenders. If this is the case, locus of control might be identified as a major dimension for rehabilitation attention.

The component labelled role perception implies that there is a clear definition of criminal and non-criminal activity. For the most part, potential offenders are clear on the definition of criminal activity. Thus, little gain could be expected from educational programs directed toward helping potential offenders to differentiate criminal from non-criminal behavior.

Assuming that a criminal behavior has occurred (this would be labelled "performance" in the model), the theory suggests that punishment should be immediate, appropriate, and at expected levels. If potential offenders choose non-criminal patterns of behavior, rewards should similarly be immediate, appropriate, and at expected levels. The feedback loops in the model imply that if criminal behavior occurs, and punishment is not immediate and "painful," the value of the punishment will be lost (or at least will not be associated with the criminal activity when it is finally administered). Further, if the probability of punishment is very low, the effort/reward probability will be increased. These feedback loops are crucial to the model. In some senses they represent the learning history or memory of the individual.

From these examples of application of the instrumentality approach to the problem of criminal behavior, it should be obvious that

the Porter-Lawler model combines some of the most compelling parts of the other three approaches. Thus, it is not an alternative approach, simply a more inclusive one. In addition, it offers the best articulated and most flexible system for environmental intervention when the target is the potential offender.

Instrumentality Theory: Non-Offender

Since the model was applied in some detail above, it is only necessary in this section to provide examples of how it might be applied in non-offender populations. Rewards and awards for bystander intervention can alter the value of the reward for intervening. The same is true of increasing the number of rewards which are available by virtue of an individual's presence in a particular geographic area. Teaching individuals the safest method of intervention will increase the skill and ability level, and consequently the "performance." Telling individuals what is expected of them in a particular situation is an effort in the direction of improving role perception. These are just a few of the strategies suggested by the model for affecting the behavior of non-offenders. It would seem that the elaborate structure of the model makes it equally valuable when applied to both offender and non-offender populations. Thus, of the four approaches reviewed, the instrumentality approach seems best suited to the problem of controlling criminal behavior. In the next section, we will review the CPTED models in an attempt to place them within the motivation framework presented earlier in this chapter.

Application of Motivational Approaches to OTREP Model

The OTREP model is an attempt to simulate the decision-making process of a potential offender. In terms of the taxonomy introduced earlier in the chapter, it is primarily a process model. It described factors which might play a role in the decision to commit a crime; more specifically, it hypothesizes that criminal activity is a result of some interaction of four primary components: Target, Risk, Effort, and Payoff. At this point, the model has not been sufficiently developed to allow functional statements about the nature of this interaction. Thus, these factors might be additively related ($T + R + E + P$) in which case an abundance of one factor might override a small amount of another in the decision-making process; alternatively, they might be multiplicatively related ($T \times R \times E \times P$) in which case low amounts of one factor might effectively cancel out the values of the other factors; finally, the process relationships might be mixed $[T \times P][R + E]$, such that minimal levels of some subset of the factors are necessary before any of the other factors are of any relevance. The exact nature of the model will depend on empirical evidence.

The OTREP model implies a rather general need approach as the dynamic element in the theory of criminal decision making. It assumes that the target represents the potential source of satisfaction of some need felt by the potential offender, although there is little discussion of what those needs might be.

On the basis of the current status of the OTREP model, it is possible to deduce certain relationships between this model of environmental impact on decision making and the models of motivation

presented earlier in the chapter. First, it might be appropriate to consider the four factors in the model from a purely motivational perspective.

Target: in some respects, the target factor begs a motivational question. While an environment might be assigned a "target value," this value is more descriptive of past events than predictive of future events. This value assumes a homogeneity of need structure among "potential offenders" and this homogeneity is highly unlikely. It is probable that this "target index" interacts with individual characteristics to yield something which might be labeled "Need Satisfaction Potential." In terms of the OTREP model, the target factor is a derivative variable, assuming its value in whole or in part from the payoff factor (the probable payoff in degree and kind from the criminal activity).

There is some value to determining the target index of various environments in that it suggests some gross measures which might be taken to effect crime rates, assuming that there are no individual differences in need structure. However, there is great potential gain from examining the interaction of target characteristics and individual need structures.

Risk: the second OTREP factor is labeled risk and might be thought of as the mirror image of payoff. In weighing an activity, a potential offender is hypothesized to "average" the advantages and disadvantages in making a decision. But as implied in the discussion of the OTREP model by the CPTED group, there are inevitable interactions between payoff and risk calculations. For example, it is not uncommon for individuals to minimize potential negative

outcomes when the value of the potential positive outcome is high and the need is great. The risk factor also begs some questions. It assumes that apprehension is always viewed negatively by the offender. This is not always true since apprehension is not necessarily strongly related to punishment. In addition, for a young offender in an inner city environment with all of its built-in punishments, a few nights in the Youth Study Center or the detention facility might have some distinct advantages.

Effort: the OTREP model proposes that the greater effort involved in the potential criminal activity, the less likely its occurrence. This assumes organisms attempt to minimize energy expenditure whenever possible. While it may be true that organisms will not expend inordinate amounts of energy in engaging in punishing activities, empirical evidence in both animal and human studies indicates that the same relationship does not necessarily hold for rewarding activities. Rats will learn to solve some rather elaborate puzzles in order to be allowed to dig sand. Individuals who have had a history of success in overcoming difficult obstacles will often seek even more difficult challenges. As a general principle, the concept of a negative correlation between required effort-expenditure and probability of criminal activity should be reconsidered.

Payoff: the final factor in the OTREP model is payoff, or the subjective value of the rewards obtained through the criminal activity. The proposed relationship between payoff and probability of criminal behavior is traditional - the higher the anticipated payoff, the more likely the criminal activity. The major challenge

in this factor from the motivational point of view is the specification of an individual's payoff matrix, given that there are heterogeneous need structures in potential offender populations. If payoff is defined in a traditional manner, i.e., money, then strategies are not terribly complicated, e.g., in the case of burglary, crack down on fences, encourage owner identification programs, etc. On the other hand, if payoff is defined in terms other than simply economic ones, the problem becomes somewhat more complicated and once again revolves around individual need patterns. For example, in the case of muggings, one might launch a neighborhood campaign ~~in~~ ⁵ ~~in~~ ^{WHICH} ridicule muggers in terms of the "skill" required. One might also introduce newspaper campaigns designed to make muggers look foolish and intellectually dull. The point is that the value of the payoff factor will be determined by what the potential offender defines as a reward, not by what a controlling agency defines as "reward."

An Instrumentality Approach to the OTREP Model

Of all the motivational approaches presented earlier, the instrumentality model of Porter and Lawler represents the most complete description of variables which fit the OTREP structure. In fact, several of the Porter/Lawler components might be more descriptive than the OTREP counterparts. As an example, defining payoff in terms of reward value and effort reward probability might make more sense than allowing degree of reward and probability of reward to interact in some unspecified manner, as is now the case in the OTREP simulation.

In the Porter/Lawler model, the target factor would be subsumed under the "Value of the Reward" component. Once again, the Porter/

Lawler model allows for a greater separation of Value from Probability than is currently afforded by the OTREP model.

The Risk factor might be redefined as anticipated punishment in traditional motivation theories. This, in turn, implies that a good deal of the literature on escape and avoidance conditioning might be relevant to a better understanding than the impact of Risk on decision making. In the instrumentality approach, this risk factor would be characterized as a negative valence which is attached to certain outcomes with a certain probability. Nevertheless, the final valence of a particular criminal activity would be determined by an averaging of all elements, both positive and negative, of which Risk represents only one.

As indicated earlier, the Effort component in the OTREP model may require some rethinking. In the Porter/Lawler model, Effort is a derivative variable which depends primarily on the value of the reward and the effort reward probability for its value. In such a framework, there is less emphasis on the amount of energy expended and more emphasis on the probability of payoff. In addition, there are instances in which energy expenditure in overcoming difficult obstacles may have some reward value of its own.

Finally, the Porter/Lawler model provides a slightly more refined view of the Payoff factor by proposing an interaction between anticipated payoff and actual payoff which in turn determines the subjective reward value of the outcome, and in some sense, the satisfaction derived from the criminal activity. It is not uncommon for various agencies to attempt to detract from the reward of a Burglar or armed robber by describing in some detail what was left

behind by the criminal. This is an indirect attempt to affect the satisfaction of the criminal and possibly the future motivation of that individual.

It would seem that the instrumentality models generally and the Porter/Lawler model specifically provides a more refined system for proposing relationships between environments and decisions than does the OTREP model. In addition, the Porter/Lawler model retains the cognitive flavor of the OTREP approach. In the process of substituting an instrumentality model for the OTREP model, the fifth factor proposed in the OTREP approach (what the criminal thinks) is represented.

Conclusion

Simulation can be of enormous value in anticipating effects of environmental, operational, or personnel changes. Thus, even a first attempt such as OTREP represents some immediate value. Regardless of whether a more sophisticated model is developed to replace OTREP, there is value in bringing other actors into the simulation. Parallel and interacting simulations representing victims, witnesses, police officers, and stable residents should also be introduced to the general simulation framework. The instrumentality approach holds equally well for each of those populations, as was demonstrated in an earlier section.

Acceptance of a framework which incorporates the characteristics of individual offenders does not necessarily exclude a consideration of environmental design issues. As a matter of fact, it allows for more refined hypotheses concerning the effects of these designs. MAN and ENVIRONMENT represent a system and the two

components are inextricably bound. The most efficient and powerful model will be one which allows for the interaction of these two components.

REFERENCES

- Adams, J. S. Injustice in social exchange. In L. Berkowitz (Ed.),
Advances in Experimental Social Psychology (Vol. 2). New York,
Academic Press, 1965
- Alderfer, C. P. An empirical test of a new theory of human needs.
Organizational Behavior and Human Performance, 1969, 4, 142-175.
- Berlyne, D. E. Arousal and Reinforcement. In D. Levine (Ed.) Nebraska
Symposium on Motivation. Lincoln: University of Nebraska Press, 1967.
- Campbell, J. P., Dunnette, M. D., Lawler, E. E. and Weick, K. E.
Managerial behavior, performance, and effectiveness. New York:
McGraw-Hill, 1970
- Festinger, L. A Theory of cognitive dissonance. Stanford, Cal.: Stanford
University Press, 1957.
- Herzberg, F. Mausner, B., and Snyderman, B. B. The Motivation to work.
New York: Wiley, 1959.
- Homans, C. C. Status among Clerical workers. Human Organization, 1953,
12, 5-10.
- Jaques, E. Equitable Payment. New York: Wiley, 1961.
- Lewin, K. Field Theory in Social Science. In D. Cartwright, (Ed.) New York:
Harper, 1951.
- Maslow, A. A theory of human motivation. Psychological Review, 1943, 50, 370-396.
- McClelland, D. The Achieving Society. Princeton: Van Nostrand, 1961.
- Murray, H. Techniques for a systematic investigation of fantasy. Journal
of Psychology, 1936, 3, 115-143.
- Porter, L. W. & Lawler, E. E. Managerial attitudes and performance. Homewood,
Illinois: Irwin Dorsey, 1968.

Premack, D. Reinforcement Theory. In D. Levine (Ed.) Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1965.

Terrace, H. S. Stimulus Control. In W. H. Honig (Ed.) Operant Behavior: areas of research and application. New York: Appleton Century, 1966.

Vinacke, E. Motivation as a complex problem. Nebraska Symposium on Motivation. Lincoln: University of Nebraska Press, 1962.

Vroom, V. Work and Motivation. New York: Wiley, 1964.

Crime and Fear of Crime Among the Elderly:
The Role of the Physical and Social Environment

Arthur H. Patterson, Ph.D.
The Division of Man-Environment Relations
The Pennsylvania State University



Crime and Fear of Crime Among the Elderly:
The Role of the Physical and Social Environment

This paper is about the problem of crime against older Americans, and also about the more pervasive corollary problem of fear of crime among the elderly. The goal is to present an innovative approach to reducing both the crime rate against the elderly and their fear of crime. This approach will be the application of crime prevention through environmental design (CPTED) concepts to the unique physical and social environments of the elderly.

The history of attempts at crime prevention through the use of environmental design is well documented in several papers (Rau, 1975; Jeffery, 1976). It is interesting to note some of the different environmental approaches which have been taken to the study of crime. There have been numerous studies of the spatial analysis of crime occurrence patterns (e.g., Harries, 1974; Pyle, 1974; Brantingham and Brantingham, 1975); studies concerned with surveys of target security (e.g., Scarr, 1973; Reppetto, 1974); studies of the land-use characteristics of crime sites (e.g., Droettboom, et al., 1971; Damer, 1974; Pablant and Baxter, 1975); and studies of crime control through architectural modification (e.g., Gold, 1970; Newman, 1972; William Brill/Associates, 1974). This work will be discussed in detail below.

None of this work has been specifically directed at the elderly. This is particularly important, for there are aspects of their physical condition and life-style that may not be amenable to crime prevention through environmental design. For example, the establishment of defensible zones of territorial influence is a basic strategy of this technique (Newman, 1972). Yet

the literature on territoriality in the aged (e.g., Lipman, 1969; Pastalan, 1970) shows clear differences in defensive behavior from the younger population. Similarly, there is evidence that the police relate to the elderly in different ways than they do to the population as a whole (Tomas, 1974; Sykes and Clark, 1975), and vice versa (Poister and McDavid, 1976). Again, this work will be discussed in detail below.

This paper will examine the crime and fear of crime problems of the elderly from a CPTED perspective. This approach will require looking at not only the physical environment of the elderly, but also their social environment, and the crime deterrent strategies employed by the police in those environments.

Crime and Fear of Crime

This section will discuss the extent of the problems of crime and fear of crime among the elderly, and will attempt to place these problems in an environmental context. Victimization and fear of victimization will be considered separately, for, as will be seen, they are different problems.

VICTIMIZATION. Recent United States' Department of Justice studies (1975) have indicated that the elderly residing in American cities are more likely to be victims of certain crimes than other segments of the society. These include higher rates of assault, larceny with personal contact, and robbery with personal injury. Further research has supported this likelihood of victimization (Tomas, 1974; Goldsmith and Tomas, 1974; Goldsmith & Goldsmith, 1976), and has begun to identify the type of criminals who prey upon the elderly (Lesnoff-Caravaglis, 1975; Magann, 1975; Select Committee on Aging, 1977).

It should be noted that some studies do not support a higher victimization rate for the elderly (e.g., Gubrium, 1974; Cook and Cook, 1976). However, this can generally be explained by such artifacts as undersampling of urban areas, when the elderly are overrepresented, and underreporting of crimes against the elderly due to inappropriate crime categories (e.g., auto theft is not a problem for elderly because many do not own autos, yet various types of verbal and even physical assault of elderly by teenagers goes unreported). Further, the impact of crime upon the elderly can be much greater than upon other segments of the society. A purse-snatch may not only take irreplaceable funds from an elderly woman, but also often results in a debilitating injury.

The reasons for this crime victimization problem (and as shall be discussed below, for the fear of crime) are manifold. One of the primary reasons is that older Americans tend to be concentrated in the inner city, where crime rates in general are higher. In 1960, almost 70% of the elderly lived in urban areas, where they were overrepresented in the urban core, and underrepresented on the city fringes (Atchley, 1972). Kennedy and DeJong (1975) used 1970 census data to study ten U.S. metropolitan areas, which ranged in size from 62,000 to 1.5 million, and again found the elderly to be overrepresented in the central city. Lawton (1975a) has partially explained this phenomenon by citing the fact that the elderly are unable (for reasons discussed below) to search for better housing, that they need the services best provided by dense (and age homogeneous) housing, and that they are thus constrained to housing which is located in dangerous areas.

Another explanation of the high victimization rate is offered by Christian (1975). He feels that the elderly, many of whom live alone, are

physically and socially vulnerable. This vulnerability leads to a decrease in social activity, and an increase in victimization and fear of crime. The role of both living alone and also of social interaction in crime against the elderly will be discussed at length below. Lawton (1975b), on the other hand, offers an ecological theory. Among other factors he attributes the high victimization rate among the elderly to the following:

- (a) 40% of the people over 65 years of age have some limitation of activity due to chronic disease;
- (b) more than 66% of the elderly have some vision defect, even with corrective lenses;
- (c) less than 25% of elderly men are in the work force, as compared with 86% of men under 65 years of age;
- (d) the 1972 median income of elderly living alone was \$2,397, as compared with \$5,018 for younger people (for elderly living in families, the median family income was \$5,968 as compared to \$11,870 for families headed by younger people); and
- (e) 28% of all older people live alone, while 9% of those under 65 years of age live alone (it should be noted that recent research has indicated a substantial increase in the number of younger Americans living alone).

A more generic psychological explanation for victimization (and fear of victimization) may be found in the shift in orientation that has been found with aging. Neugarten and associates (1964) have described this as the shift to less active mastery in later years. Similarly, this has been viewed as a shift from active to passive behavior and from aggression to

cooperation (Clark, 1967); and as a movement from competitive behavior to cooperation and from aggressive behavior to passivity (Riley, 1969).

Lawton, Nahemow, Yaffe, and Feldman (1976) best summarize the lack of environmental control which can partially account for the crime problem in the elderly. They state that:

- (a) limits in the visual and auditory acuity of the elderly can result in potential threats going unrecognized;
- (b) the elderly tend to remain passive, and not take any corrective action as a crime occurs;
- (c) there is a physical limit to the actions the elderly can take, such as running to escape assault;
- (d) the social isolation of the elderly leads to vulnerability;
- (e) the economic deprivation of the elderly leads to limits on safe actions, such as driving a car or taking a taxi; and
- (f) for numerous reasons, the elderly are unwilling and unable to move from dangerous neighborhoods.

Thus, aspects of the physical and social environments of the elderly appear to be directly related to victimization. For example, several studies have found that the elderly living in single family dwellings (as opposed to multi-family dwellings), living alone, and in urban areas are more susceptible to victimization (Gubrium, 1974; Christian, 1975; and Goldsmith and Tomas, 1974). Similarly, elderly living in urban public housing suffer high victimization rates (Tomas, 1974; U.S. Department of Housing and Urban Development, 1975). Finally, Lawton (1975a, 1975b; Lawton, et al., 1976) has cited several environmental factors, such as

quality and location of housing and social and personal factors, which are significantly related to the victimization of the elderly.

FEAR OF CRIME. Although the above discussion refers to why the elderly are victimized, it is also relevant as well to their fear of crime. Fear of crime, or anxiety about being victimized, is an exceedingly important factor among the aged for several reasons. Firstly, while a relatively small and finite number of elderly are actually victims of crime, the fear of being victimized touches almost all of the urban elderly. Secondly, as will be discussed below, this fear has profoundly negative effects upon the behavior and morale of these elderly. Much recent research reveals the great extent of fear of crime in the aged. A Louis Harris survey conducted for the National Council on Aging (1975) on a national sample of people 65 years of age and older found that fear of crime was rated by 23% of the respondents as being their most serious problem. That was even higher than the problem of poor health, which was chosen by 21% of the respondents. Further, the study reported that crime in the streets was the greatest fear among people over 65 years of age. Elderly with poverty level incomes feared crime the most, and elderly women feared crime more than elderly men. A recent study by Lebowitz (1975) indicates that elderly who live alone greatly fear crime, and a similar study by Schooler (1970) found that the elderly are more concerned with their safety than with social interaction. In an extensive study of Chicagoans 65 years of age and older, Bild and Havighurst (1976) found that fear of crime was rated as their largest problem. When asked to rate their serious problems, 41% of the respondents selected fear of crime.

This concern about crime has been shown to have important effects on the behavior of the aged. Several studies have found that housing choices

by the elderly are significantly affected by their fear of crime (Regnier, 1974; Biderman, Johnson, and McIntrye, 1967). The mobility of the elderly, their freedom to go where and when they want, is also curtailed by their fear. A 1973 Gallup Poll indicated that many people over 50 years of age were fearful to the extent that they were afraid to leave their homes at night. This was supported by Brown (1975), who found that the elderly fear walking alone at night, and Lawton, et al., (1976), who also found that elderly are afraid to leave their homes at night. Many studies have found that this lack of freedom of mobility is not limited to just at night (Cunningham, 1975; Lawton, et al., 1976; National Council on Aging, 1975).

Fear of crime which limits mobility also affects the social behavior and morale of the elderly. Lawton and Kleban (1971) report that this fear prevents satisfaction in most other areas of their lives. Further, the aged go to great lengths to reduce their potential exposure to crime (Lawton, et al., 1976). This results in a reduction of social interaction (Schooler, 1970), and adversely affects various other aspects of their life-style (Cunningham, 1975; Delaney, 1976).

It is interesting to note how closely these data on fear of crime in the urban elderly approximate the research on fear and behavior in crime-ridden public housing projects. Two such projects which were extensively studied are Pruitt-Igoe, in St. Louis (Rainwater, 1966), and the Scott/Carver Homes in Dade County, Florida (William Brill/Associates, 1974). In both cases, fear of crime among the residents led to decreased mobility, both during the day and also at night. This in turn led to decreased social interaction, a lack of community cohesiveness, and feelings of alienation. The ultimate result was exceedingly poor tenant morale and low life-satisfaction.

Again, it is important to note how these studies deal directly with the relationship of the environment to fear. For example, Schooler (1970) cites numerous environmental and social factors which he believes are related to concern with safety. Brown (1975) cites being alone at night as a major reason for fearing to walk outside, and that finding is supported by the Gallup Poll (1973) on crime. Lawton and Kleban (1971) have reported on how fear of crime has resulted in elderly citizens being afraid to leave their homes. Similarly, it has been shown that elderly who live alone fear crime much more than those who do not live alone (Lebowitz, 1975).

In a study of elderly Chicago residents, Bild and Havighurst (1975) found that fear of crime was a more severe problem for those who rented, as opposed to those who owned their homes. However, it is important to note that even for the elderly home owner, fear of crime was considered a serious problem. Cunningham studied the patterns of crime against the elderly in Kansas City (1975), and found that mobility and social patterns changed in direct relation to the residents' perception of their proximity to criminals and crime areas. In the same vein, a National Council on Aging study (1975) found that income level and race were important variables for fear of crime in the elderly. In a study of neighborhoods, Regnier (1974) found that the use of neighborhood facilities by the elderly was affected by their perceptions of crime rates. Lawton, et al., (1976) cite (among other factors) the social isolation and inability to change environments of the elderly as part of the adverse effect of crime and fear of crime among the aged.

Summarizing these and other studies, one finds four major factors which are related to fear in the elderly: sex, economics, race, and community size (Select Committee on Aging, 1977).

Sex. Elderly women have a higher level of fear than do elderly men. This pattern holds true, of course, for the non-elderly as well. Yet, elderly men and women are more similar in their fear of crime than are non-elderly men and women. This is mainly due to the fact that elderly men are more fearful of being victimized than are non-elderly men.

Economics. The lower the economic level of the elderly person, the more fearful of crime that person is. This relationship is readily understandable in light of the fact that poorer elderly tend to live in declining urban neighborhoods in lower quality conditions, to be in poorer health, and to actually be victimized more than wealthier elderly. This is of importance because so many of the elderly are of low economic status.

Race. Many studies have shown that black elderly Americans have more fear of crime than do white elderly Americans. The 1975 Louis Harris survey found that for people over 65 years of age, 21% of the white population as compared to 41% of the black population reported crime as a serious personal problem. However, it should be noted that race is highly correlated with economic level among the elderly. Black elderly tend to also be poor elderly. In studies of more affluent black elderly, their fear of crime more closely approximate that of the more affluent white elderly. There is, unfortunately, a lack of studies of other minority elderly groups.

Community size. The larger the community, the more fear of crime there is among the residents. This is true for all age levels, but is particularly true among the elderly. The reason for this is that larger communities result in environments that are conducive to fear, while smaller communities do not. For example, rural and suburban elderly tend to know more of their neighbors, and have less fear of strangers than do urban elderly. Furthermore,

urban environments present more potential hazards to the elderly than do rural and suburban environments (cf. Select Committee on Aging, 1977).

Why are the elderly so fearful of being victimized? Part of the answer involves the loss of control of the environment, both real and imagined, which occurs as people age. Many gerontologists have noted changes in physical skills, psychological traits, and social situations which lead to this loss of control.

Neugarten (1964) has discussed a personality trait called "active mastery", which describes the extent to which people view themselves as being able to take care of their own problems. This is opposed to passivity, where a person accepts problems and tries to adapt to them, rather than trying to change things. Neugarten has shown that middle-aged people are more likely to show active mastery than are older people, and that, in fact, there is a shift in psychological orientation among many older people from active mastery to passivity. This shift is reflected in an acceptance of a condition of fear in the elderly, rather than actively attempting to make changes which could reduce that fear.

Similarly, Lawton, et al., (1976) have described how the aging process involves a series of losses. The elderly are often faced with a reduction in income, which leads to reduced ability to obtain desired goods and services. Almost 85% of the elderly have some sort of chronic illness, and 12-15% are partially or totally disabled. Many elderly suffer from poor nutrition. Many live in poor quality housing, with inadequate transportation and access to needed services. Finally, there is a continual re-education in the older person's social network: the death of a spouse or friend, and the loss of a job or meaningful social roles.

These conditions lead to the older person perceiving (in many cases realistically) that they are unable to deal with the threat of a crime. This, naturally, leads to fear. They often doubt their ability to deal with the problem, and feel they have lost control of their environment.

The Environment and the Elderly

Thus, it is apparent that the problems of crime and fear of crime among the elderly are related to the physical and social environments of the elderly. However, before applying the CPTED concepts to these problems, it is important to examine the general effects of the environment upon the elderly. It is possible that there are unique relationships between the elderly and the environment which could possibly block the success of the CPTED approach.

RELOCATION. Much of the early work on the relationship between environment and the elderly dealt with the effects of physical relocation. In an early study, Aldrich and Mendkoff (1963) reported high mortality for those aged and disabled who were relocated. In a series of similar studies, Leiberman (1965, 1969) found that the aged were highly vulnerable to environmental change. He reported adverse effects upon the affect and behavior of those who were moved, especially to institutions. In a recent study of forced nursing home relocations, exceptionally high mortality rates resulted among those moved (Bourestom and Tars, 1974). However, Carp (1966) found positive increases in the morale and life-satisfaction of elderly who moved into the Victoria Plaza housing project. Those findings were sustained in a 10 year follow-up study (Carp, 1975).

MORALE AND SOCIAL INTERACTION. There have been numerous studies of the effects of neighborhood characteristics on the morale and social behavior of the aged. Schooler (1969), in a national study of over 4,000 older Americans, found that the physical environment was related to the psychological adjustment of the elderly, through the role of mediating social interaction. That is, aspects of the physical environment were directly tied to the amount and type of social interaction experienced by his elderly respondents. In a later study he delineated those environmental factors and social factors which he believed were relevant to the morale of the elderly (Schooler, 1970). The environmental factors included such features as distance to facilities, condition of the dwelling unit, size of the dwelling unit, and amenities. The social factors included such features as neighboring, social organizations, contact with children, and family size. In similar work, Rosenberg (1970) has stated that the neighborhood and its social context is exceedingly important to the morale of older urban dwellers. He points out that the housing environment must support social interaction and activities in order for the resident to achieve life-satisfaction. Housing which, for any number of environmental reasons (e.g., location, population mix, etc.) did not facilitate social interaction, had a negative impact upon the life-satisfaction of the elderly resident(s).

In another study of neighborhood characteristics, Regnier (1974) cites several environmental variables as affecting the behavior of the elderly in the area, such as their residential selection. Examples of these variables include topography, traffic and land-use patterns, transportation, and district designations. The effects of what they termed the "physical resource environment" on the well-being of older tenants in planned housing

were studied by Lawton, Nahemow, and Yeh (1976). They found that aspects of the environment such as the size of the community, the age composition within the housing, the activity level in, and quality of, the neighborhood, and the presence of facilities significantly affected the tenants sense of well-being. The age homogeneity variable was reviewed by Grant (1970), who found evidence for higher morale in age homogeneous areas.

The presence and convenience of various neighborhood facilities have also been cited in several studies as being important for the morale of an area's residents. Carp (1966, 1975) attributed the high morale of the Victoria Plaza residents to, among others, the presence of valued facilities. Similarly, numerous studies have found that increased proximity of desired community facilities positively affected resident well-being (Schooler, 1970; Lawton and Cohen, 1974; Lawton, et al., 1976; Regnier, 1976).

Specific aspects of the dwelling unit, as well as the neighborhood, have likewise been shown to have an impact on the morale and behavior of the elderly. In an early work, Kleemeier (1961) detailed three continuums of housing for the elderly. These are age-segregated/non-segregated, institutional/non-institutional, and congregate/non-congregate. The segregation continuum refers to the percentage of elderly versus non-elderly residents (the higher the percentage of elderly, the more segregated); the institutional continuum refers to the institutional nature of the housing; and the congregate dimension refers to the degree which the elderly are dwelling together with other, non-related, elderly. In seminal work, Rosow (1967, 1968) investigated the characteristics of housing which affect the friendship patterns of the elderly. He found that various aging-related factors can result in isolation, and that this isolation has adverse effects on the

morale and friendship patterns of elderly living in age-concentrated (homogeneous) housing. Rosow found that the working-class elderly were more severely affected than the middle-class and more cosmopolitan elderly. Lawton and his associates (Lawton, 1975b; Lawton and Cohen, 1973; Lawton, Nahemow and Teff, 1975) have found that aspects of the physical environment and the social environment (e.g., significant others, demographic characteristics, norms and values) markedly affect well-being in the elderly. Christian (1975) has found that those elderly who live alone tend to be vulnerable. He states that this vulnerability results in a decrease in social activities, which causes a decrease in life-satisfaction. Interestingly, Sherman (1974) reports that there is no greater mutual help in retirement housing which is age homogeneous than in dispersed housing, which tends to be age heterogeneous.

INTIMACY AND FRIENDSHIP. The housing environment has also been shown to affect intimacy and friendship among the elderly. As mentioned above, Rosow (1967, 1968) has studied the negative effects of isolation and age-homogeneous housing on the friendship pattern of certain elderly. Similarly, Noelker (1975) studied the intimate relationships of elderly living in a residential home. The results indicated that more than one-half of the residents' intimate friends were located outside of the residence building. This finding is in contrast with a standard social psychological explanatory factor for friendship, which is spatial proximity (Festinger, Schacter, and Back, 1950). However, Friedman (1966) studied social interaction in a home for the aged, and did find that proximity was highly related to intimacy and friendship.

TERRITORIAL BEHAVIOR. Although there is a large body of literature on territorial behavior in humans that has major implications for crime prevention through environmental design (which will be discussed below), there is a limited amount of work on territory in the aged. DeLong (1970) has stated that the elderly use space in different ways than do younger people, and that this has led to a lack of communication between the generations, especially with staff in institutions. He reports that aggression can be reduced and social interaction increased in the elderly by facilitating their maintenance of territory, such as through private rooms in institutions. Lipman (1961, 1965, 1969) conducted a series of studies on territorial behavior in retired British elderly. He found consistent evidence of territorial behavior, with the prevalent form being the claiming of spaces such as chairs and tables, and that this behavior was positively associated with morale. A developmental explanation of territoriality has been offered by Pastalan (1970). He views territorial behavior as an effort to achieve privacy through physical withdrawal and limitations of interaction. This social interactional definition of territoriality has important implications for the role of defense in territorial dominance, which will be discussed below.

PLANNING ENVIRONMENTS. It is interesting to note that there has been a dramatic increase in the literature on planning and managing environments for the aged. This has particular significance for considering environmental changes designed to deter crimes against the elderly. Early work was primarily concerned with the design of buildings for the aged (Musson and Heusenkveld, 1963; Weiss, 1969). However, more recent work has dealt with applying gerontological research to the planning and managing not only of

buildings, but also of the entire environment of the elderly. For example, Ostrander (1973) has been concerned with planning nursing homes from an environmental psychological perspective. Byerts (1974) and Lawton (1975a) have written on planning and managing housing environments, and together they have extended this concept to the planning of communities for the elderly (Lawton and Byerts, 1973).

CPTED Applied to the Elderly

A basic assumption of CPTED is that an effective use of physical design can lead to better citizen control of the environment, and thus to a reduction in the incidence and fear of crime. Deterrence can be defined as discouragement of the commission of a crime through the provision of some form of hindrance to that activity. Prevention is the actual averting of crime by the provision of enough deterrence (Riccio, 1974). Early indications that environmental design could have a deterrent effect upon urban crime can be found in the work of Jacobs (1961). Her early discussions of American cities indicated that multiple land use along residential streets might provide an interaction between the environment and the inhabitants which could facilitate surveillance, and therefore increase the safety of the streets. This work grew into the numerous approaches to environment and crime discussed above, such as spatial analysis of crime occurrence patterns, studies of target security, and studies of land-use characteristics of crime sites. More recent deterrent efforts have been those which have used architectural modification as an environmental intervention.

Early work by Coit (1965), Gold (1970), and Wood (1972) pointed out that increasing surveillance opportunities by increasing the public spaces

under the control of tenants could result in a decrease in crime. Fairley and Liechenstein (1971) investigated those hypotheses in New York City apartment buildings. Newman (1972) studied the deterrent value of what he termed "defensible space" in a New York public housing project. Newman stated that the physical environment has the capacity to create perceived zones of territorial influence. Tenants will tend to maintain surveillance over this territory, and this will reduce both crime and the fear of crime. The result will be that more people will then use the area, further increasing the surveillance and the reduction in crime. Newman postulated that the probability that these environmental interventions will result in actions against crime depend on:

- (a) the tenant's sense of territory and his being accustomed to defending that territory;
- (b) the extent to which activity is understood to be occurring in that area;
- (c) the observer's identification with the victim or the property; and
- (d) the extent to which the observer feels that he can effectively alter the course of events being observed (Newman, 1972; 1973).

Newman's techniques have been applied in several public housing projects. Environmental modifications which have been attempted include: providing surveillance opportunities; clearly identifying the functions of various spaces (reducing ambiguity as to ownership and what behaviors should occur there); limiting access to the area; separating conflicting uses (teenage play areas and shopping areas); providing facilities (amenities); improving area aesthetics; and many more (Sagalyn, 1973; William Brill/Associates,

1974; Kohn, Franck, and Fox, 1975). None of these approaches have yet clearly demonstrated a reduction in criminal acts and fear of crime. Similarly, the viability of this approach for the elderly has not been established. This will be discussed in detail below.

SOCIAL ENVIRONMENT AND POLICE STRATEGIES. Significantly, there has been no work as of yet which has interrelated these studies of the designed environment with work on the social environment and the strategies applied by the police as deterrents in these environments. This would seem to be especially important in attempting to apply this approach to the crime problems of the elderly, where, as discussed above, the social environment has been shown to have a significant impact upon their lives. Also, the elderly have been shown to have special problems in interacting with the police (Tomas, 1974; Sykes and Clark, 1975), as will be explicated below in the section on police techniques. This lack of consideration of the other variables was put quite succinctly by the William Brill/Associates in their report to the United States Department of Housing and Urban Development (HUD) on comprehensive security planning for the Scott/Carver Homes (1974). They stated that a one-dimensional approach (architectural modification) was not sufficient to solve the multi-dimensional problem that they faced.

AN OPEN-SYSTEMS MODEL. Underlying these approaches to crime prevention through environmental design is a model of crime control put forth by Jeffery (1971). He holds that what he terms "environmental engineering" is the only model which attempts to deal with crime before it occurs, and through the use of direct (as opposed to indirect) controls. Although endorsing Jeffery's model, this paper extends its approach to include an open-systems theory model (Katz and Kahn, 1966). This approach was put

forth as a crime control model by Lewitt (1975). Basically, open-systems theory is a social-psychological model which incorporates all the processes dealt with in social psychology (social motivation, person perception, attitudes, communication, group behavior, etc.) into a system of social relations and behavior which results in some end product. The example most often given is that of a school, where the product of all the systems is the educated graduate, who has values and a social disposition, as well as a subject matter, knowledge and skills. Lewitt suggests open-systems theory as a model for crime control in that it can be used to study the effects of various community organizations upon one another, and thus indicate effective points for research and action.

It appears possible to expand that model to apply to research that considers the physical environment, the social environment, and extant police techniques as interacting subsystems, all part of a larger total system. It is probable that this multiple system approach would integrate the social environment and police approaches to crime prevention into the CPTED perspective. Including the social environment will more deeply involve disciplines such as sociology, psychology, and planning in investigating the interrelationship of the physical and social environment in social control. Similarly, police techniques are another form of social control which is interrelated with the physical and social environments. It is important to note that modifications can be made in any of the three subsystems (e.g., physical environment: design changes; social environment: community organization or quality of life changes; police: strategy or technique changes) if those changes are indicated.

SOCIAL FACTORS. The work of Newman (1972) and others has indicated that the physical environment can evoke social behaviors which will work to prevent crime. But these efforts have not, as of yet, yielded integrative social and behavioral theories. Also, those which have been produced (e.g., Newman's conception of the environment creating perceived zones of influence, or "territoriality") have not been, in the main, totally consistent with extant social theories (Patterson, 1974a; Patterson, 1975b). Further, these research efforts have tended to look only at the effects of the physical (or designed) environment upon the social environment, and have only recently begun to consider that the existing social environment interacts with the physical environment (e.g., studies of management policies in housing projects). This is ironic, for it is probably at the level of the social environment that "positivistic" criminologists have been most active, while tending to ignore the designed environment.

It has long been known that various ethnic subcultures have been successful in maintaining social control within their group, and that this control has been related to the physical environment in which they lived (Gans, 1962; Michelson, 1970). Recent authors (Nieburg, 1974; Lewitt, 1975) have extended this work specifically to crime control and have concluded that neighborhood and community are crucial to crime prevention. This concept has been well recognized at several levels. Coit (1965) has argued for tenant control of multi-family dwellings in order to reduce crime. The National Advisory Commission on Criminal Justice (1973) has stated that there is no single solution to crime prevention, and that citizen involvement is necessary to aid the police in their work, and thus reduce crime. A return to community control has been advocated by Nieburg (1974). He feels

that a strong structure and organization in the neighborhood can deal more effectively with crime than can more formal government organizations.

Similarly, both the report on Newman-type architectural modifications (Kohn, Franck, and Fox, 1975) and also the comprehensive security planning for the Scott/Carver Homes (William Brill/Associates, 1974) discussed above, call for an increase in community involvement in crime prevention. Data from a recent LEAA funded study (Center on Administration of Criminal Justice, University of California, Davis, 1975) indicate how important the social environment can be in the control of crime: in a long term study of robbery in Oakland (which has one of the highest robbery rates in the country), it was found that 42% of the criminals committed robbery in their own neighborhood; further, 60% to 90% of the robbery apprehensions (in most cities) were made as the result of immediate actions of citizens or police. Citizen crime-reporting projects (Bickman, 1976) indicate some success in increasing community cohesiveness and increasing the number of reports of crime to police. These citizen crime-reporting projects are an effort to change the social environment so that it better complements the designed environment in deterring crime.

The above discussion of the impact of the environment on the elderly illustrates some ways in which victimization and fear of crime, as well as general morale, are affected by the social environment. One aspect of the social environment, territoriality, is particularly salient. Newman has stated that crime deterrence results from the capacity of the designed environment to create zones of territorial influence which the inhabitants will survey and defend (1972). The literature on territoriality generally supports this concept. The animal territoriality literature is extensive

and presents the concept of dominance of home territories, and defense of that territory (e.g., Leyhausen, 1965). Some ethologists have extended this concept to humans. Ardrey (1966) states that one of the functions of territoriality in humans is to provide for the claiming and defense of space, which results in freedom from anxiety regarding safety. More recent social psychological theories of territorial behavior view territory as providing for a stable social organization through smoothing social interaction, making explicit role relationships and status hierarchies (Edney, 1974), and as a self/other boundary control mechanism which regulates interpersonal interaction (Altman, 1975).

Beside Newman (1972, 1973), a few other authors have viewed territoriality as being salient in preventing asocial behavior. DeLong (1970) found that the presence of territory reduces aggressiveness in institutional inmates, and Schorr (1966) reported that giving tenants a sense of territory in the semi-public spaces of a slum area can reduce crime and what he terms "social insecurity". These conceptions stem from the various definitions of territoriality in the literature, almost all of which are concerned with defense of space. A prototypical example would be Altman's definition: "Personalization and ownership [of space] are designed to regulate social interaction and to help satisfy various social and physical motives. Defensive responses may sometimes occur when territorial boundaries are violated" (1975, p. 107).

However, a few definitions of territoriality do not involve defense. An example of this type would be that of Sundstrom and Altman: "Territorial behavior [is the] habitual use of particular spatial locations" (1974, p. 115). This non-defensive definition of territoriality which deals with

habitual use of space is consonant with the work discussed above on territorial behavior in the elderly. As was noted, Lipman (1961, 1965, 1969) found territorial behavior among his elderly population only in the form of identifying as "their own" specific spaces such as chairs and tables. Further, Leyhausen (1965) has reported a decline in dominance over territory in animal populations when the inhabitant grows older. This would appear to bring into question the effectiveness of reducing crime against the elderly by creating territorial zones of influence, and reinforces the importance of examining social as well as physical variables.

Similarly, Altman (1975) has made the distinction among primary, secondary, and public territories. The distinction comes from how central the territory is to the inhabitants (how important it is in their lives), and for how long (duration) they occupy the territory. Thus, homes are an example of primary territories, social clubs of secondary territories, and park benches of public territories. Altman states that violations of primary territories are much more serious than violations of secondary or public territories, and are much more likely to lead to defensive behaviors. Crime prevention through environmental design is primarily aimed at secondary and public territories: building hallways and courtyards, streets and parks. This is appropriate, for those settings are where most crimes tend to occur (and, as discussed above, are often where the elderly fear to go). However, if Altman is correct, people are less likely to defend those territories, and thus the potential crime deterrent value is somewhat attenuated.

A recent study by the author (Patterson, in press, 1978) has shown that territorial behavior is associated with a reduction in fear of crime among elderly homeowners. The houses of elderly urban dwellers were analyzed by

trained observers for the presence of territorial markers, such as barriers (e.g., fences, hedgrows) and signs (e.g., "no trespassing"). The homeowners were then interviewed to assess their fear of crime. The fear of crime questionnaire contained attitude items probing fear of violence (such as: "I am afraid to go out of my home at night.") and fear of theft (such as: "When I am away from my home I worry that it will be burglarized."). There was also an attitudinal measure of territoriality, which probed the residents' feelings of controlling and being responsible for his/her home.

The territoriality attitude score was significantly related to the presence of territorial markers. Those homeowners who were attitudinally territorial displayed more markers than those who were not. Thus, the display of territorial markers was associated with a feeling of territoriality in the homeowner. The homeowners were then divided into either a high or low territoriality group based upon their number of territorial markers. It was found that the high territoriality elderly were less fearful (of both violence and theft) than were the low territoriality elderly. There was also a significant interaction of territoriality with whether or not the elderly person lived alone. Elderly living alone were fearful when they were low in territoriality, but were not fearful when they were high in territoriality; the fear level of elderly who lived with others was not affected by territoriality.

This study would seem to indicate that for those elderly who displayed territorial markers, and were thus actively involved in controlling their environment, territorial behavior could lead to a reduction in fear. However, this reduction was affected by other aspects of the social environment, such as whether the person lived alone or with others.

Thus, it becomes apparent that one cannot effectively study the role of the physical environment in crime prevention without also studying the role of the social environment. This is even more important when the role of various police techniques and strategies are also considered, as discussed below. Another reason for studying both the physical and social environments is that some CPTED approaches may actually have a negative effect. As pointed out by Patterson (1975a) and Brickman (1974), it is possible for many of the typically employed design techniques (locks, keys, fences, surveillance devices, etc.) to actually increase people's sense of isolation and insecurity, and decrease people's willingness to build and extend their contacts with others in the setting. In that case, the designed environment is actually working against the deterrence of crime and facilitating the fear of crime. One argument put forth in favor of defensible space approach is that it can avoid this problem, as opposed to the "target hardening" techniques mentioned above.

POLICE TECHNIQUES AND STRATEGIES. As stated above, there has been little investigation of the relationship of police deterrent techniques and strategies to the physical and social environment. Police behavior is obviously a part of the social environment, but the police are not generally viewed as an integral component of neighborhood culture and living arrangements (with the possible exception of the neighborhood policeman or British Bobbie model). It should be noted that police techniques and strategies are often designed to deter crime, rather than just react to it (Leonard, 1972; Riccio, 1974).

There are many special considerations involved in police relations with the elderly. Among these is that research has shown that police interactions

with civilians tend to be based on status and roles. As the individual's status declines, so does police deference toward the individual (Sykes and Clark, 1975). This has obvious implications for the elderly, who suffer greatly from lack of status in our society. This is supported in work by Poister and McDavid (1976), who found that elderly who, as victims, had interacted with the police, held low opinions of police services. Similarly, many police have lowered regard for the elderly due to the many nuisance calls they receive from elderly citizens (for example, many elderly calls are because the person actually desires company rather than requires assistance). In reaction to this, and in recognition of the special victimization problems of the aged, some police departments have instituted specific strategies and programs for them (Tomas, 1974; Michel, 1974). Most of these programs involve educating police in the problems of the elderly, and the elderly in ways to better handle their law enforcement problems.

In general, police strategies involving deterrent techniques have been made for reasons independent of local environmental needs (Wilson, 1968; Sullivan and Siegel, 1972). However, many of the innovative police techniques (e.g., team policing, neighborhood policeman, tactical and flying squads, police-community relations units) can provide beneficial fits with certain physical and social environments. For example, Block and Specht (1973) have pointed out the benefits of team policing. They note that teams can remain in an area for an extended period of time in order to develop a thorough knowledge of and relationship with the area and its inhabitants. The teams can then become identified with neighborhoods and otherwise homogeneous areas. They can thus plan specific programs for environments and be trained to work in and with a homogeneous segment of the community (e.g., the elderly).

However, the literature indicates both successes (Schnelle, Kirchner, McNees, and Lawler, 1975) and failures (Knelling, Pate, Deckman, and Brown, 1973) with special patrol strategies.

It is apparent that certain patterns of the urban environment may be particularly appropriate for certain strategies (Katz, 1973). That is, characteristics of a neighborhood, or business district, may have particularly appropriate environmental fits with certain police techniques. For example, both Block and Specht (1973) and Sherman, Milton, and Kelly (1973) have advocated fitting police teams to the characteristics of the community. McDowell (1975) has noted that the police are a part of the urban environment and a reflection of the environment in which they work. That is, they are an element of the social environment. He feels that police techniques should consider social factors (such as social class and population characteristics) and environmental factors (such as residential areas, commercial districts, and transportation networks). Similarly, Wilson and McLaren (1972) point out that special problems require special tactics, ranging from bicycle patrols to helicopters. Special, in this case, can refer to aspects of the environment such as unique physical and social structures.

Considering police techniques in a system with the physical and social environments raises certain interesting questions. There is no reason to expect a uni-directional relationship between changes in the physical and/or social environments and citizen interactions with the police (Wilkins, 1965). Thus, changes in factors such as community cohesiveness may well change citizen demands for responsiveness from the police. As a community becomes more cohesive, it is possible that the police will receive more requests for service, because of citizens' increased caring about their

neighborhood. Further, the citizens may demand a higher quality of service, backed by the social power which cohesiveness can bring. Similarly, if design changes should convert "public" to "private" territory, there might be an effect on the police's "right" and need to patrol, and the public's attitudes toward that patrol. Also, increasing the sense of territoriality, "property", or "community" through environmental manipulations might change people's willingness to accommodate police intrusions. Or, if physical or social changes actually did result in a decrease in crime, the need for police services might decrease. On the other hand, the result of increased citizen surveillance could result in increased reports to the police. Further, creating the wrong combination of physical and social changes might actually reduce public safety by reducing the efficiency of police techniques and strategies.

It should be noted that this approach to the study of the physical environment, the social environment, and police techniques includes only three of the many interacting subsystems. A total open-systems approach would also recognize other relevant subsystems (e.g., the courts). However, the subsystems selected here appear to be the most salient to reducing victimization and fear of crime in the elderly from a CPTED perspective.

Conclusion

The above discussion points out that both crime and fear of crime pose very real threats to the quality of life of urban older Americans. Further, it has been shown that aspects of the environment of the elderly have profound effects upon the morale and behavior of the elderly, including

affecting their probability of being victimized and their fear of being victimized.

It is apparent that the recent work in crime prevention through environmental design (CPTED) has significant potential for providing environmental interventions which could reduce the victimization rate and fear of crime in the elderly. However, there are features unique to the elderly, such as their relationship to their physical and social environments, the nature of their territorial behavior, and their interactions with the police, which require an innovation, open-systems approach.

REFERENCES

- Aldrich, C., and E. Mendkoff. Relocation of the aged and disabled: A mortality study. Journal of the American Geriatrics Society, 1963, 11, 155-194.
- Altman, I. The Environment and Social Behavior. Monterey: Brooks/Cole, 1975.
- Ardrey, R. The Territorial Imperative. New York: Atheneum, 1966.
- Atchley, R.C. The Social forces in later life, an introduction to social gerontology. Belmont: Wadsworth, 1972.
- Bickman, L. National Evaluation Program, Phase I Summary Report. Citizen crime reporting projects. Chicago: Loyola University, 1976.
- Bild, B., and R. Havighurst. Senior citizens in great cities: The case of Chicago. Gerontologist, 1975, 16, 1, part II. Problems of elderly Chicagoans, 47-52.
- Biderman, A., L. Johnson, and J. McIntyre. Report on a Pilot Study in the District of Columbia on Victimization and Attitudes Toward Law Enforcement. NCLEAJ Field Survey I. Washington, D.C.: U.S. G.P.O., 1967.
- Block, P., and D. Specht. Neighborhood Team Policing. Washington, D.C.: The Urban Institute, 1973.
- Bourestan, N., and S. Tars. Alternatives in life patterns following nursing home relocation. The Gerontologist, 1974, 14, 506-509.
- Brantingham, P.J., and P.L. Brantingham. Crime and land use in an English middle town: toward a theoretical model of crime prevention through environmental design. Paper presented to the American Society of Criminology, Toronto, October, 1975.
- Brickman, P. Social Conflict. Lexington: D.C. Heath, 1975.
- Brown, E. Fear of assault among the elderly. Paper presented to the 28th meeting of the Gerontological Society, Louisville, 1975.
- Byerts, T. (ed.). Housing and Environments for the Elderly. Washington: Gerontological Society, 1974.
- Carp, F.M. A future for the aged: The residents of Victoria Plaza. Austin: University of Texas, 1966.
- Carp, F.M. Impact of improved housing on morale and life satisfaction. The Gerontologist, 1975, 15, 511-515.

- Center on Administration of Criminal Justice, University of California, Davis. The prevention and control of robbery. University of California, Davis, 1975.
- Christian, D. Social activity and the housing environment of the elderly. Working paper two, College of Environmental Design, University of California, Berkeley, 1975.
- Clark, M. The anthropology of aging: A new area for studies of culture and personality. Gerontologist, 1976, 7, 55-64.
- Coit, E. Report on family living in high apartment buildings. Public Housing Administration, 1965.
- Cook, F.L. and T. Cook. Evaluating the rhetoric of crisis: A case study of criminal victimization and the elderly. Social Service Review, December, 1976, 632-646.
- Cunningham, C. Pattern and effect of crime against the aging: The Kansas City Study. Paper presented to the National Conference on crime against the elderly, Washington, D.C., 1975.
- Damer, S. Wine alley: The sociology of a dreadful enclosure. Sociological Review, 1974, 22, 221-248.
- Delaney, P. New York Times, April 12, 1976, p. 1.
- DeLong, A. The micro-spatial structure of the older person: Some implications of planning the social and spatial environment. In L. Pastalan and D. Carson (eds.) Spatial Behavior of Older People. Ann Arbor: University of Michigan, 1970.
- Droettboom, T., R. McAllister, E. Kaiser, and E. Buter. Urban violence and residential mobility. American Institute of Planners Journal, 1971, 37, 319-325.
- Edney, J. Human territoriality. Psychological Bulletin, 1974, 81, 12, 959-975.
- Fairley, W., and Mc Liechenstein. Improving Public Safety in Urban Apartment Dwellings. New York: Rand Corp., 1971.
- Festinger, L., S. Schachter, and K. Back. Social Pressures in Informal Groups. New York: Harper, 1950.
- Friedman, E. Spatial proximity and social interaction in a home for the aged. Journal of Gerontology, 1966, 21, 566-270.
- Gallup Poll. Special report on crime in the United States. Gallup Opinion Index, Report No. 91, January, 1973.

- Gans, H. The urban villagers. New York: Free Press, 1962.
- Gold, R. Urban violence and contemporary defensive cities. American Institute of Planners Journal, 1970, 36, 146-159.
- Goldsmith, J., and S. Goldsmith. Crime and the elderly. New York: Lexington, 1976.
- Goldsmith, J., and N. Tomas. Crimes against the elderly: A continuing national crisis. Aging, 1974, 236-237, 10-13.
- Grant, D. An architect discovers the aged. Gerontologist, 1970, 10, 275-281.
- Gubrium, J. Victimization in old age: Available evidence and three hypotheses. Crime and Delinquency, 1974, 20, 3, 245-250.
- Harries, K. The geography of crime and justice. New York: McGraw-Hill, 1974.
- Jacobs, J. The Death and Life of Great American Cities. New York: Random House, 1971.
- Jeffery, C.R. Crime prevention through environmental design. Beverly Hills: Sage, 1971.
- Jeffery, C.R. Criminal behavior and the physical environment. American Behavioral Scientist, 1976, 202, 149-173.
- Katz, M. Patterns of arrest and the dangers of public visibility. Criminal Law Bulletin, 1973, 4, 311-324.
- Katz, D., and R. Kahn. The social psychology of organizations. New York: Wiley, 1966.
- Kelling, G., T. Pate, D. Deckman, and C. Brown. The Kansas City Preventive Patrol Experiment: A summary report. Washington, D.C.: Police Foundation, 1973.
- Kennedy, J., and G. DeJong. Aged in cities: Residential segregation in 10 U.S. metropolitan areas. Paper presented to the 28th meeting of the Gerontological Society, Louisville, 1975.
- Kleemeier, R. (ed.) Aging and Leisure. New York: Oxford University Press, 1961.
- Kohn, I., K. Franck, and A. Fox. Defensible space modifications in row house communities: Summary of report submitted to NSF. November, 1975.

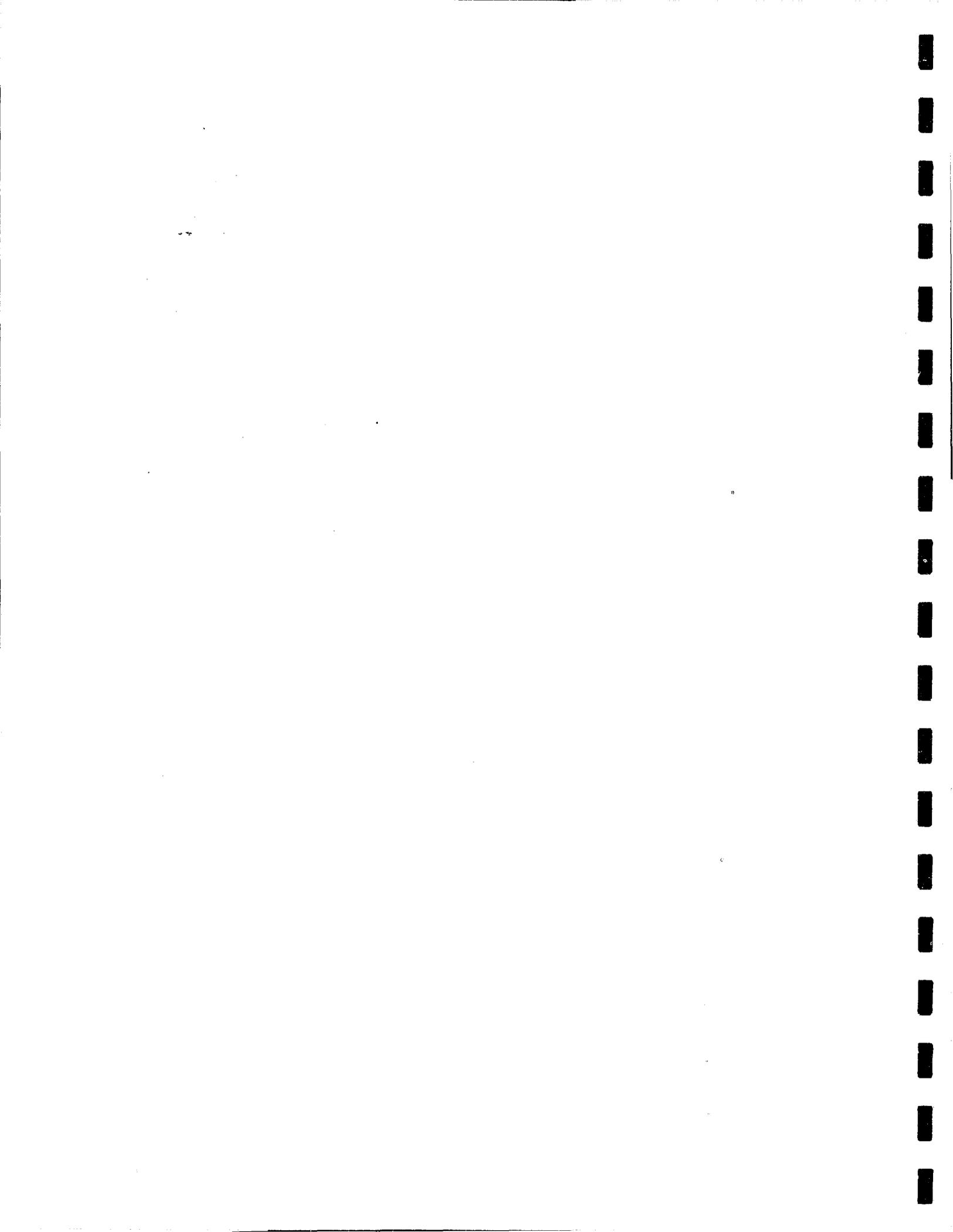
- Lawton, M. Planning and Managing Housing for the Elderly. New York: Wiley, 1975a.
- Lawton, M. Competence, environmental press and the adaptation of older people. In P. Windley, T. Byerts, and F. Ernest (eds.) Theory Development in Environment and Aging. Washington, D.C.: The Gerontological Society, 1975b.
- Lawton, M., and T. Byerts (eds.) Community Planning for the Elderly. Washington, D.C.: The Gerontological Society, 1973.
- Lawton, M.P., and J. Cohen. The generality of housing impact on the well-being of older people. Journal of Gerontology, 1973, 28, 194-204.
- Lawton, M.P., and J. Cohen. Environment and the well-being of elderly inner city residents. Environment and Behavior, 1974, 6, 194-211.
- Lawton, M.P., and M. Kleban. The aged resident of the inner city. Gerontologist, 1971, 11, 277-283.
- Lawton, M.P., L. Nahemow, and J. Teff. Housing characteristics and the well-being of elderly tenants in federally assisted housing. Journal of Gerontology, 1975, 30, 601-607.
- Lawton, M.P., Nahemow, L., Yaffe, S., and Feldman, S. Psychological impact of crime and public housing. In Goldsmith, J. and Goldsmith, S.S. (eds.), Crime and the elderly: Challenge and response. New York: Heath, 1976.
- Lawton, M.P., L. Nahemow, and T. Yeh. Neighborhood environment and the well-being of older tenants in planned housing. Unpublished manuscript, 1976.
- Lebowitz, B.D. Age and fearfulness: Personal and situational factors. Journal of Gerontology, 1975, 30, 696-700.
- Leiberman, M. Depressive affect and vulnerability to environmental change in the aged. Proceedings of Seminars, 1961-1965. Chapel Hill: Duke University Gerontology Council, 1965.
- Leiberman, M. Institutionalization of the aged: Effects on behavior. Journal of Gerontology, 1969, 24, 330-340.
- Leonard, V. Police Crime Prevention. Springfield: Charles Thomas, 1972.
- Lesnoff-Caravaglia, G. Return of the furies: Young criminals versus old victims. Paper presented to National Conference on Crime against the Elderly. Washington, D.C., June 1975.

- Lewitt, D. Social psychology and crime control. Journal of Social Issues, 1975, 31, 1, 193-210.
- Leyhausen, P. The communal organization of solitary animals. Symposium Zoological Society London, 1965, 14, 249-262.
- Lipman, A. Role conceptions and morale of couples in retirement. Journal of Gerontology, 1961, 16, 267-271.
- Lipman, A. Old peoples homes: Sitting and neighborhood integration. The Sociological Review, 1965, 15, 323-338.
- Lipman, A. Territorial behavior in the sitting rooms of four residential homes for old people. British Journal of Geriatric Practice, 1969, 3, 23-33.
- Magann, A. Criminals no respecters of age. Perspectives in aging, 1975, 4, 4, 17-22.
- McDowell, C.P. Police in the Community. Cincinnati: W.H. Anderson, 1975.
- Michel, G. Operation reassurance. Law and Order, 1974, 22, 6, 84-86.
- Michelson, W. Man and his urban environment. Reading: Addison-Wesley, 1970.
- Musson, N., and H. Heusenkveld. Buildings for the elderly. New York: Reinhold, 1963.
- National Advisory Commission on Criminal Justice. Community Crime Prevention. Washington, D.C.: LEAA, 1973.
- National Council on the Aging. The myth and reality of aging in America. Washington, D.C.: National Council on the Aging, 1975.
- Neugarten, B.L. and associates. Personality in middle and late life. New York: Atherton, 1964.
- Newman, O. Defensible space. New York: Macmillan, 1972.
- Newman, O. A Design Guide for Improving Residential Security. Washington, D.C.: U.S. Department of Housing and Urban Development, 1973.
- Nieburg, H.L. Crime prevention by urban design. Society, 1974, 12, 1, 41-47.
- Noelker, L. Intimate relations in a residential home for the elderly. Papers presented to the 28th meeting of the Gerontological Society, Louisville, 1975.

- Ostrander, E. Research-based nursing home design: An approach for planning environments for the aging. International Journal of Aging and Human Development, 1973, 4, 307-317.
- Pablant, P., and J. Baxter. Environmental correlates of school vandalism. American Institute of Planners Journal, 1975, 41, 270-279.
- Pastalan, L. Privacy as an expression of human territoriality. In L. Pastalan and D. Carson (eds.), Spatial Behavior of Older People, University of Michigan, 1970.
- Patterson, A. Social control, density, and tall buildings. Paper presented to the American Psychological Association, Chicago, August, 1975a.
- Patterson, A. Criticism of Newman's defensible space. Cited in I. Altman, The environment and social behavior. Monterey: Brooks/Cole, 1975b.
- Patterson, A. Crime prevention through environmental design: Introductory Remarks. Symposium at the annual convention of the American Psychological Association, New Orleans, 1974a.
- Patterson, A. Territorial behavior and fear of crime in the elderly. Environmental Psychology and Nonverbal Behavior, in press, 1978.
- Poister, T., and V. McDavid. A report of Harrisburg residents' evaluations and preferences for local governmental programs and services. Institute of Public Administration, Pennsylvania State University, January 1976.
- Pyle, G. The spatial dynamics of crime. Chicago: University of Chicago Geography Research Paper #159, 1974.
- Rainwater, L. Fear and the house-as-haven in the lower class. J. American Institute of Planners, 1966, 32, 23-30.
- Rau, R.M. Crime prevention through environmental design: A historical perspective. Washington, D.C.: National Institute of Law Enforcement and Criminal Justice, 1975.
- Regnier, V. Neighborhoods as service systems. In Lawton, M.P., Newcomer, R.J., and Byerts, T.O. (eds.). Community planning for an aging society. Stroudsburg, PA.: Dowden, Hutchinson, and Ross, 1976.
- Regnier, V. The effect of environmental incentives and delimiters on the use and cognition of local neighborhood areas by the elderly. Paper presented to the 27th meeting of the Gerontological Society, Portland, 1974.
- Repetto, T. Residential crime. Cambridge, Mass.: Ballinger, 1974.

- Riccio, L. Direct deterrance: An analysis of the effectiveness of police patrol and other crime prevention technologies. Journal of Criminal Justice, 1974, 2, 207-217.
- Riley, M.W. Socialization for the middle and the later years. In D. Goslin (ed.), Handbook of Socialization Theory and Research. Chicago: Rand McNalley, 1969.
- Rosenberg, G.S. The workers grows old, San Francisco: Jossey-Bass, 1970.
- Rosow, I. The Social Integration of the Aged. New York: Free Press, 1967.
- Rosow, I. Housing and local ties of the aged. In B. Neugarten (ed.) Middle Age and Aging, Chicago: University of Chicago, 1968.
- Sagalyn, A. Residential Security, Washington, D.C.: U.S. Department of Justice, LEAA, 1973.
- Scarr, H.A. Patterns of burglary, Second Edition. Washington, D.C.: G.P.O. (National Institute of Law Enforcement and Criminal Justice), 1973.
- Schnelle, J., R. Kirchner, M. McNeese, and J. Lawler. Social evaluation research: The evaluation of two police patrolling strategies. Applied Behavior Analysis, 1975, 8, 353-365.
- Schooler, K.S. The relationship between social interaction and morale of the elderly as a function on environmental characteristics. Gerontologist, 1969, 9, 25-29.
- Schooler, K. The effect of environment on Morale. Gerontologist, 1970, 10, 194-198.
- Schorr, A. Slums and social insecurity. Washington, D.C.: HEW, Social Administration Report No. 1, 1966.
- Select Committee on Aging, Subcommittee on Housing and Consumer Interests. In Search of Security: A National Perspective on Elderly Crime Victimization. Washington, D.C.: Government Printing Office, 1977.
- Sherman, S. Mutual assistance and support in retirement housing. Paper presented to the 27th annual meeting of the Gerontological Society, Portland, 1974.
- Sherman, L., C. Milton, and T. Kelly. Team Policing. Washington, D.C.: Police Foundation, 1973.
- Sullivan, S., and L. Siegel. How police use information to make decisions. Crime and Delinquency, 1972, 253-262.

- Sundstrom, E., and I. Altman. Field study of territorial behavior and dominance, Journal of Personality and Social Psychology. 1973, 30, 115, 124.
- Sykes, R., and J. Clark. A theory of deference exchange in police-civilian encounters. American Journal of Sociology, 1975, 81, 584-599.
- Tomas, N. Reducing Crimes Against Aged Persons, Federal Regional Council Task Force, Mid-Atlantic Region, U.S. Department of HEW, 1974.
- United States Department of Justice. Crime in eight American Cities. Washington, D.C.: U.S. Department of Justice, 1975.
- U.S. Department of Housing and Urban Development. Residential security 2. HUD Challenge, 1975, May.
- Weiss, J. Better Buildings for the Aged. New York: Hopkinson, 1969.
- Wilkins, L. Social Deviance. Englewood Cliffs: Prentice Hall, 1965.
- William Brill/Associates. Comprehensive security planning: A program for Scott/Carver Homes. Washington, D.C.; WBA, 1974.
- Wilson, O., and R. McLaren. Police Administration. New York: McGraw-Hill, 1972.
- Wilson, V.Q. Varieties of police behavior. Cambridge: Harvard, 1968.
- Wood, E. Housing design: A social theory in G. Bell and J. Tyrwhitt (eds.) Human Identify in the Urban Environment. Harmondsworth: Penguin, 1972.



ENVIRONMENTAL DETERMINANTS OF VICTIMIZATION BY CRIME

AND ITS CONTROL:

OFFENDERS AND VICTIMS*

by

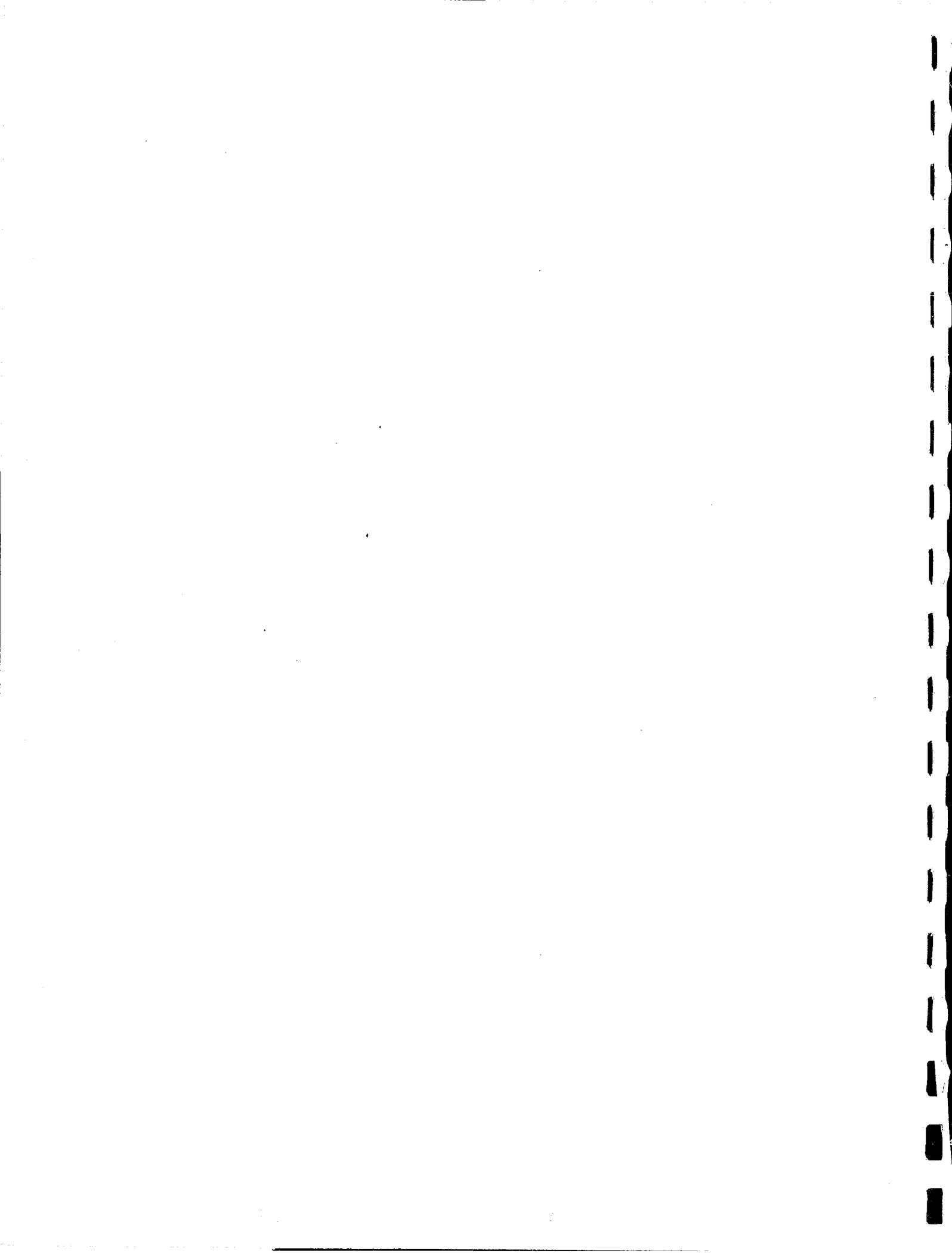
Albert J. Reiss, Jr.

Yale University
December, 1977

Revised February, 1978

*A paper prepared for the Westinghouse National Issues Center

March 7 draft



INTRODUCTION

Victimization by crime and the reduction of victimization through measures of crime control seem to be determined both by features of the environment and by characteristics of offenders and their victims. It is difficult, however, to disentangle person from environment effects, given the current status of explanatory theories and their empirical foundation. This paper focuses, therefore, on environmental determinants of victimization by crime and its control, particularly on how the environment of victims and offenders is related to risk of victimization by crime and how changes in environments affect those risks.

Major theories that attempt to explain victimization by environmental determinants and its social control by changing environments and their organization focus on environmental opportunities for offending and the propensity or proneness of victims to control them. These theories, however, lack the specificity required of causal explanations. They serve more to orient exploration than to explain victimization and its social control. The major goal of this paper thus is to advance some propositions based on empirical investigations of environmental determinants and environmental control of victimization and offending. The propositions fall into three major areas of empirical investigation. They are: (1) offender selection of victims; (2) victim proneness to victimization by crime; (3) environmental control of offending.

These propositions must be regarded as tentative formulations for which the theoretical and empirical foundation are far from adequate. Exceptions occur for the propositions offered and their limits often cannot be specified.

Moreover, the methodological and technical adequacy of any given empirical investigation on which the generalizations are based is often below that essential for standards of proof. Not only are investigations limited in their sample of crimes and crime victims, but many studies are poorly designed or given to errors in analysis. We have generally ignored these errors and limits in design. The strategy has been to take them into account in the selection of empirical studies and in drawing inferences from them, but we have erred in the direction of including rather than excluding data that pose problems for analysis and inference. Doing so is based on the belief that a series of propositions may lay the groundwork for developing theory and research on environmental determinants and control of victimization and offending.

Offender Selection of Victims

Just on what basis offenders select their victims is not clearly established. This is owing in part to the fact that there are few in-depth studies of offenders and offending groups and their processes in selecting victims. Much of the information on the selection of victims is based on the behavior of offenders in committing offenses or on victim reports of offender behavior. There are no adequate theoretical models of offender selection of victims. Such models may be premature, given what is known about how offender and victim behavior varies by type of crime, age, and sex of offenders, and for territorial variation in crime rates. Among variables most commonly chosen to explain offender selection of victims are macroscopic variables such as the structure of communities and their opportunities for offending and microscopic ones such as the nature of offender risk taking or the form of social relationship between

victims and offenders.

In keeping with the general focus of this paper, our attention is on structural and location features of environments that are related to offender selection of victims. Less attention is given to specific social and psychological characteristics of victims that may affect offender selection of victims.

1. Offenders in the aggregate minimize distance between their place of residence and the location of their offenses or the residence of their victims.

On the average, offenders do not move long distances to search for victims or move long distances to pre-selected victims.

Michael Smith (1972:80) found that 23 percent of all property crimes known to the police in Raleigh, North Carolina were domestic, i.e., committed by offenders who lived in the same census tract as their victims. This percentage was identical to that found by Reiss (1966:4) for Seattle, Washington. Despite the fact that a majority of all property crimes are not domestic, in both Raleigh and Seattle, distance has a negative influence on crime so that as the distance between census tracts increases, the fewer the crimes that are imported or exported to other tracts (Smith, 1972:80). Census tracts adjacent to that where the offender lives are the most likely after domestic tracts to be chosen by offenders for their crimes (Reiss, 1966:4).

Thomas Smith found that all crimes in Rochester, New York are subject to the inverse effects of distance; the mean distance between the residence of offenders and the location of their offenses was one mile (1976:805). The majority of all offenses occurred within two miles of the offender's residence. The distance between offender's and victim's residences may be somewhat greater than this since person victimized away from home may be closer on the

average to the offender's than to their own place of residence. This is especially true for crimes committed in commercial or downtown areas of cities (T. Smith, 1976:803).

1a. As the distance between communities increases, the fewer the offenders imported from outside the community to commit crimes within it and the fewer the offenders exported from the community to commit crimes outside the community.

Michael Smith determined the flow of crime from offender to victim areas on the assumption the flow depends upon the average income of potential victims, the number of criminal alternatives in the victim area, the average income of potential offenders, the number of potential offenders, and the distance between two areas. Aggregation of this flow model over all offender areas leads to an equation for the importation of crime to the victim area for all other areas, with importation of crime as a function of the average income of potential victims, the number of criminal opportunities in the victim areas, and the availability of offenders from all other areas. Aggregating the flow model over all victim areas, the exportation of crime from the offender area to all other areas is a function of the average income of potential offenders, the number of potential offenders in the offender areas, and the availability of criminal opportunities in all other areas. (M. Smith, 1972:78). Thomas Smith (1976:808-10) similarly found that a simple model of crime opportunities fits the exportation of crime better than a model of intervening opportunities.

1b. The younger the offender, the greater the tendency to minimize

distance between the residence of offender and the territorial location of the victim when victimized.

The majority of offenses committed by youthful offenders are within a neighborhood or residential community in which the offender resides and are of short distance from the residence of the offender. Suttles (1968:207-210) found that almost two-thirds of all offenses known to the police that were committed by juvenile gang members living in an inner city community of Chicago took place within that community. Nearly one-half of those committed within the community took place within one block of the residence of the nearest offender. Similarly Turner (1965:4) found that among juvenile delinquents in Philadelphia, nearly three-fourths of all their offenses were committed within one mile of the offender's home and that the mean distance between place of residence of offender's home and the place of occurrence of the offense was 0.4 miles. On the basis of interviews with 97 burglars, Reppetto (1974:23) reported that juvenile burglars were more likely to work with friends or in gangs and to travel on foot to commit burglaries in or around their own neighborhood.

Correlatively, as the age of offenders increases, distance between residence of the offender and location of the offense increases. Normandeau, reporting for all Philadelphia robbery offenders, found a higher average distance of 1.57 miles than Turner found for all juvenile offenses in the same city (1968:268). Reppetto (1974:18, 24-25) found that juvenile burglars (under age 18) worked primarily in their own neighborhood while those between 18 and 25 committed at least half of

their burglaries outside their own neighborhood. Older offenders, age 25 and over, typically preferred to work in more affluent neighborhoods, particularly single-family suburban households. The distance offenders move is related to their means of movement to victims. Older offenders typically use their own car; those between 18 and 25 typically use a stolen car and young offenders commonly move on foot.

The exact effect of age on minimizing distance in the selection of victims, independent of type of offense, is not known. There is considerable variation in age by type of offense and the distance moved varies by type of offense.

Though Thomas Smith did not find a model of intervening opportunities fit as well as a simple opportunities model for property offenses (1976: 811), the distance moved to commit property offenses may fit a model of intervening opportunities if the age of offenders is taken into account. Young offenders generally make short distance moves to commit low profit offenses but with age and experience longer distance moves are made to opportunities where offenses are more profitable.

The average distance between the residence of offenders and the location of their offenses varies considerably among types of crime. In general, there is considerably greater minimization of distance between the residence of offender and the location of offenses for major crimes against persons and property than for minor offenses, though there is considerably greater variation in average distance among minor than major crimes, perhaps owing in part to the greater diversity in types of offenses among minor crimes. A number of propositions are advanced that may explain differences in the territorial location of victims and offenders

among types of crime.

1c. The distance between the territorial location of victims and offenders or of parties to "victimless crimes" is minimized where patterned social relationships are instrumental conditions of the offense.

There are three major types of patterned social relationships that are instrumental conditions for offenses. Prior conflict relationships between victims and offenders known to one another often give rise to offenses against the person. Institutionally organized settings such as those of neighborhood bars and clubs similarly are instrumental in generating conflicts that give rise to offenses against persons. Finally, certain victimless crimes involve patterned social transactions based on prior social relationships; narcotics violations typically involve such patterned relationships.

Boggs (1965:903) observed that areas which have high occurrence rates of criminal homicide and aggravated assault also tend to have high offender rates for these types of crime. Similarly, Reiss (1966a: Table 1) found the greatest concentration of victims and offenders living within the same census tracts of Seattle for the major offenses of attempted rape and aggravated and simple assault, and for minor offenses against families and children. These offenses typically result from conflict relationships among parties previously known to one another or, as in the case of a fair proportion of assaults, among casual acquaintances in local organizations such as bars, clubs, and street groups. Suttles (1968:209-10) found that the vast majority of offenses of fighting, assault, affray, attempted rape, and intercourse among juveniles occurred among offenders and victims who lived within the same community.

Transaction crimes based on prior social relationships appear to depend upon local market relationships, at least for the lower echelon transactions in the hierarchy. Reiss (1966:Table 1) found that arrests for narcotic drug violations among the transacting parties in Seattle, Washington, showed a fairly high concentration within the same census tract.

ld. The distance between the territorial location of victims and offenders is minimized where knowledge of victim risks is an instrumental condition of the offense.

Robbery shows considerable localization of offenders and victims. The mean distance between the place of the offense and the offender's residence was 1.57 miles in Normandeu's study of robberies in Philadelphia (1968:268). Suttles (1968:209) found that almost two-thirds of strong-arm robberies committed by juveniles living in a Chicago community occurred within that local community. Further confirmation for localization of street robberies is found in Weir's study based on interviews with city street muggers. These street muggers traveled only one-half mile on the average to commit each robbery (Weir:1973-4). Weir also noted that most street-muggers operate in only one or two areas of the city and that three-fourths live either in or adjacent to those areas. Knowledge of the area is important in their selection of victims. There is some variation in the distance between offenders and their victims among types of robbery. Based on an area analysis of robbery occurrence with robbery offender rates, Boggs found that street and miscellaneous robberies were more localized than business robberies in St. Louis city (1965:Table 6).

Little information is available on the localization of purse-

snatchings and pocket-pickings, though patterns probably differ for the two offenses. Suttles data on purse-snatchings by juvenile gang members indicates that they commit the bulk of these offenses within their community of residence; of those committed within the community area for more than half the residences of victim and offender are separated by less than three blocks. Since a substantial majority of all purse-snatchings are committed by juveniles, there is reason to conclude purse-snatchings are highly localized for victims and offenders.

To commit residential burglary may require more knowledge of local conditions than to commit nonresidential burglary. Boggs suggests that residential burglary requires knowledge useful to burglars such as knowing when premises are occupied, how to enter without detection, whether there is surveillance by police or watchmen, and where to look for objects. Such prior knowledge may be less important for commercial burglary where occupancy is patterned and the objects of theft readily ascertained without prior knowledge. Bogg's data for St. Louis City show high occurrence and offender rates for residential burglary (Boggs:1965:907) while nonresidential burglary rates show a greater territorial dispersion between offender's residence and the location of nonresidential establishments. The offender's age affects the selection of burglary locations. As already noted, Reppetto (1974:25) found that older burglars were more likely to move longer distances for residential burglary, particularly to affluent suburban neighborhoods. Other offenders, in contrast with younger ones, were more likely to use planned strategies to get to know a neighborhood where they did not live before attempting burglary there. Young offenders are most limited in their territorial movement (largely

by foot) and the familiarity derived from living in an area affects their selection of burglary locations. The data for public organizations are unsatisfactory but it appears that offenses against public organizations such as schools or park facilities are localized in relation to the residence of offenders. Such offenses not uncommonly involve juveniles and include burglary, theft, and malicious destruction of property; Suttles (1965:209) reports that minor public offenses such as false fire alarms and turning on fire hydrants all are local.

Malicious destruction of property is particularly localized for offenders. Suttles found that only six percent of all such offenses occurred outside the community area in which the juveniles lived and almost two-thirds occurred within two blocks of the residence of the juvenile offender (Suttles:1968:Table 21). Malicious mischief or destruction of property may involve not only familiarity with local conditions but symbolic forms of association with the property damaged. Often noted, though not well documented, is that prior associations with persons who own or represent damaged property generate the "maliciousness" or destructive behavior by juveniles. Prior hostile encounters with school officers or neighbors may cause destructive behavior against their property, but since vandalized property often is unoccupied--a condition known to local youths--such prior relationship may be less important than often is assumed. Arson often requires familiarity with the property, though the causes of arson vary considerably. An unknown proportion of arson is a form of profit-taking where owners collect fire insurance for unprofitable or otherwise unusable buildings; these owners may employ experienced arsonists. This form of arson is radically different from that committed

by juveniles who "set fires" in their local area or from those of the classic "fire setter" who is thought to satisfy psychological needs. Arrests for arson are relatively uncommon and more likely to involve juveniles than adults. Since juveniles may be arrested for arson more often than adults, it is not surprising that arson is fairly localized within the residential community of the arrested offender (Reiss, 1966a:Table 1).

1e. The smaller the distance between low income and business areas, the greater the amount of crime against businesses.

The income of potential offenders, a measure of the opportunity cost of crime, is negatively related to the amount of crime that offenders produce. Low income areas produce more offenders than do high income areas in Raleigh, North Carolina (Smith, 1972:84). Yet, the income of potential residential victims of crime in Raleigh had little influence on importing or exporting crime while the presence of business opportunities for crime, particularly for high income areas, had a significant effect on these flows. The proportion of non-residential opportunities for crime within a census tract was, in fact, the single most important determinant of imported crime. Since distance had a negative effect on flows, business areas adjacent to low income areas were most vulnerable to victimization. Boggs (1965:907) similarly found that in St. Louis City businesses located in high income neighborhoods adjacent to high offender areas had the highest rate of business victimization.

Older and more experienced offenders seem to move longer distances to high income areas for residential as well as commercial burglaries. Reppetto (1974:25) notes that older burglars disproportionately chose

affluent suburbs in the Boston area and moved longer distances to commit those offenses.

The movement of offenders from low to adjacent high income areas perhaps is related to more general patterns. The burglary and robbery rates of an area are positively correlated with the rates in adjacent areas. Repetto (1974:35) found that the residential burglary rate of almost all residential areas in the Boston metropolitan area was positively correlated with the rate in surrounding residential areas. This tendency is exaggerated for adjacent low and high income areas by the increased movement of low income offenders into high income areas i.e., by high import of low income offenders to adjacent high income areas and low export of high income offenders to adjacent low income areas. If these inferences are correct, offenders in low income areas account for the high rates in both adjacent high and low income areas. There are then core areas for the production of offenders who move relatively short distances to commit their offenses so that high income areas are at greater risk when they are located adjacent to low income areas.

If. The more socially visible are offenders, the greater their risk of detection. The greater their risk of detection because of social visibility, the more likely an offender is to restrict offending to areas of low social visibility.

Offenders are more likely to restrict their movement in offending than are victims to restrict their movement as potential victims. Victims appear to have little choice in restricting movement to and from their residence, though they have somewhat greater control over the means of movement. High income victims generally have greater control over more secure means of movement to and from their residence, such as by auto-

mobile, than do low income victims. Yet, victims have fewer options to restrict their movement to places where they are socially visible than do offenders, given their commitment to patterns of social activity that are territorially dispersed. They become particularly vulnerable to victimization in situations where they are socially visible away from their place of residence.

Symbolic visibility is determined in part by social definitions of situations. Nowhere is this more apparent than in social definitions of "suspicious persons". Patterns of residential segregation by class and race give rise to the definition of "suspicious persons" both by residents and by law enforcement officers. Young persons are regarded as "suspicious" or "out-of-place" in some social settings more often than are older persons, thereby restricting their range of potential victims. Operators of business establishments often assume, for example, that young persons are more likely to shoplift than are older persons and thus regard them as requiring direct surveillance. Still other public settings where freedom of access and movement is taken for granted are less likely to lead to social definitions of "suspicious persons", regardless of their social visibility. Definitions of persons as "suspicious" based on their social visibility thus varies by the social role, location, and characteristics of people. Little is known about how such social definitions relate to the actual visibility of persons, but both actual visibility and social definitions of the "visible" seem to enter into offender calculations of risk of detection.

Tien et. al., (1976:104) report that interviewed black and white offenders were not significantly different in their choice of victims,

tactics, or timing of offenses but that they reported selecting areas for offending where they felt least conspicuous. Reppetto (1974:16) similarly found that at least one-fifth of the residential burglars he interviewed mentioned choosing their offense target because they felt inconspicuous, i.e., they fit into the neighborhood because they were of the same age or race as the residents.

Race may be particularly important as a characteristic of social visibility. Tien et. al., (1976:104) report that black burglars avoided white suburbs where they felt out of place and white burglars did not go into ghetto areas. Arrest data are consistent with these reports, though they could simply confirm that law enforcement officers are more sensitized to search for offending among those who differ from a local population. Only seven percent of the arrested offenders in a predominantly white suburb were black and only 16 percent of those arrested in a black ghetto were white (Tien et.al., 1976:106). Both race and class thus may increase vulnerability to social definitions of potential offenders.

The effect of social visibility on the movement of offenders can also be inferred from evidence on race patterns in offender selection of victims. Cross-race (black-white) victimization rates are generally low for major crimes against the person. Robbery is the only major crime against persons involving substantial cross-race victimization. Reiss (1966b: Table 26) found that for both street and commercial robbery, armed and unarmed, blacks were not vulnerable to robbery by white offenders, while whites are most vulnerable to robbery by blacks when they operate commercial or industrial establishments in black ghetto areas or when they move to public areas where there is substantial access by both blacks and

whites. Mulvihill, Tumin, and Curtiss (1969:214-15) report even greater disparities for armed and unarmed robbery; 47 percent of all armed and 44 percent of all unarmed robberies involved a black offender and a white victim while only 2 percent of all armed and 1 percent of all unarmed robberies involved a white offender and a black victim. They do not report data on the location of robberies by race of offender and victim but their data on offenses for 17 cities is consistent with the explanation that cross-race robbery offenses occur primarily where the black offender is less socially visible than the white victim, as in ghetto areas, or where both victim and offender lack social visibility, as in central city locations.

Juvenile offenders seem more socially visible and subject to apprehension outside than within their neighborhood or community. The only offenses for which Suttles found more juveniles were arrested outside than within the community area were those of trespassing, curfew, loitering, and carrying weapons (1968:207). Each of these offenses is closely related to a law enforcement agent's defining the juvenile as a "suspicious person" or as engaging in activity that may lead an officer to stop and question or to search the juvenile. As Suttles observes, juveniles probably commit these offenses more frequently within than outside their neighborhood, but officials do not as often arrest for such offenses when the juvenile is close to home.

The visible effects of race and age aside, little is known about how other elements of social visibility restrict offenders in their selection of victims or of offending situations. That factors such as race, sex, age, social class and location enter into definitions of suspicious persons,

at least for some offenses, seems likely. Certainly the police utilize such criteria in deciding whom to stop, question, search, or arrest. Suspiciousness is not based solely on personal characteristics of offenders, however, but to their presence in offenders in particular social situations. A group of poorly dressed juveniles in or around a new rather than an old automobile, for example, is more likely to arouse suspicions of auto theft. Offenses such as trespass, loitering, vagrancy, and runaway arise for "suspicious persons" in "suspicious situations".

2. All other conditions being equal, offenders select victims that are socially and psychologically distant.

Offenders select strangers as their victims in crimes against persons, except for offenses of criminal homicide or assault (more so for simple than aggravated assault) (Mulvihill, et.al., 1969:217; NICJIS, 1976:82-83). Less is known about how property offenders select their victims. Interviews with property offenders indicate they avoid organizational victims, whether households, commercial establishments, or public organizations, when well known within the organization. Employee theft may be greater within large than small organizations where employee and employer are known to one another.

Social and psychological as well as territorial distance enters into offender selection of victims. While juvenile gang offenders are more likely to select burglary, theft, robbery, and purse-snatching victims from outside their neighborhood who are not known to the offender, when offenders select such victims inside their neighborhood, they seldom are local residents of their ethnicity (Suttles, 1968:210). Offender selection of victims depends, of course, upon the degree of social heterogeneity in residential areas. Suttles selected

areas that included several rather distinct white ethnic and black neighborhoods within the same community, so that local opportunities existed for offenders to select victims who were socially different. Where such opportunities exist, Suttles suggests that bonds of common ethnic identity, kinship, and neighborhood define a common morality that limits selection of victims for these offenses to those outside these social bonds (Suttles, 1968:229-33). Thus, while an increase in "neighborliness" may restrict the selection of victims to non-neighbors, his evidence does not suggest that neighborhoods reduce crime, only that it affects offender selection of victims to socially distant persons or outsiders.

Repetto provides two measures of how the social cohesion of neighborhoods can affect offender selection of victims. At least one in 10 of his interviewed burglars reported that a main reason for selecting their target was that the neighbors did not know one another; this appears to be somewhat more the case for young than old burglars, though the difference is not significant. At least 2 in 10 burglars selected isolated neighborhoods; i.e., ones characterized by high transiency or dispersed single family housing. This was not the case for any of the juvenile burglars and was most likely to characterize older burglars who are more likely to move long distances to commit residential burglary (Repetto, 1974:16). A related finding by Repetto (1974:68) is that next to actual occupancy of the dwelling unit, residential burglary offenders reported they were most likely to be deterred by the presence of neighbors or other possible witnesses. Repetto also developed a measure of neighborhood social cohesion based on length of residence and mutual assistance. Though the overall differences are not significant, neighborhoods with low cohesion have a substantially higher burglary rate than those with moderate or high cohesion (Repetto, 1974:47-48).

Proneness to Victimization

The social location of victims in time, territorial, and social space affects their risk of victimization. These general organizational conditions inhere in both the personal characteristics of victims and their choice and destiny as to where they live and move. Whether one is destined to live in an urban ghetto or can exercise choice to live in a more distant and affluent suburb affects ones proness to victimization by both person and property crimes.

Within any territorial space, there are structural domains and social patterns of movement that also affect proneness to victimization. The degree of control that persons may have over these domains or patterns of movement varies considerably. One may have less control over the journey to work or to shop for goods than one has over the security of one's immediate dwelling. Often security of domains is more determined than a matter of choice. What one has by way of physical security of a dwelling place may be highly determined by ones income and tenant status. Yet whether one locks windows or doors is potentially under the direct control of victims.

Location and structural proneness to victimization should vary considerably by type of crime. The determinants of situation proneness to victimization can be substantially different, for example, for burglary, robbery, auto theft, and employee theft. For most offenses, all too little is known about the structural and locational conditions that lead to victim proneness or their capabilities to deter crime. Our discussion below, therefore, focuses disproportionately on offenses for which there is a body of research findings, particularly burglary and robbery. Some comparisons are made with crimes against persons.

One measure of victim proneness is the risk of victimization. Risk of victimization by crime is a probability statement about the chances of experiencing actual or attempted damage or loss from crimes. Risk of victimization by crime varies considerably among types of offenses. The determination of what units are at risk for which offenses is not easily resolved, however. The National Crime Survey (NCS) of victimization by crime selects persons, households, and commercial establishments as units at risk, disregarding altogether public organizations (NCJISS. 1973:9). Persons are not considered at risk for all offenses in which there is contact with a person. The commercial establishment is the unit at risk for robberies of employers while the person is at risk for all other robberies. Similarly, for an offense such as burglary, the NCS considers households at risk for residential burglaries and business establishments for commercial burglaries. Burglaries of other nonresidential establishments are not measured in the NCS. The NCS regards motor vehicle theft as a household crime with the household as the unit at risk, though even for households, only those that own automobiles are actually at risk.

Both persons and automobile registrations have been used as units at risk for motor vehicle theft. Reiss (1966:76) found that the rate for auto theft in the United States was more than twice as great when automobile registrations were used as the unit at risk than when population was the unit at risk; for Chicago, Illinois, it was three and one-half times greater for motor vehicle registrations than for inhabitants. More recently, Hindelang, using victim survey data for eight American cities, found that the rate of motor vehicle theft was 41 per 1,000 households but when only households owning motor vehicles were regarded as units at risk, the rate per 1,000 motor vehicles owned dropped to 36 since

there was on the average 1.6 motor vehicles per household. Were the household rate calculated only for households that owned automobiles, the household rate would be greater than that for all households. Further refinements are possible since past studies have shown that the risk of victimization varies with make and model of automobile and its locks.

Much of the aggregate data on offenses is commonly misinterpreted as reflecting risks of victimization (Scarr, 1973:104; SCCJPP, 1972:15 Chimbos, 1973:323). Any burglary series, for example, will disclose that residential burglary is more common than nonresidential burglary and that burglary of public organizations such as schools is less common than either of these. But there are, of course, more residences than there are commercial establishments and far fewer schools than either of these units. To measure and compare risks, rates must be based on the appropriate units at risk.

Several generalizations are offered concerning the major structural determinants of victim proneness, though generally there are few studies to test the generalizations.

1. The higher the income of a community within an urban area, the fewer the property offenses produced by resident offenders and the fewer offenders exported to commit property offenses elsewhere; the income of an area has a negligible effect on the importation of offenders from other areas (Smith, 1972: 81-83).

Increasing income has a significant deterrent effect on the production and export of offenders. Smith (1972:8;) found that in Raleigh, North Carolina, the income elasticity of property crime was estimated to be $-.79$; as incomes in a tract rise by 10 percent, the export of crime can be ex-

pected to drop by about 7.9 percent. The negligible effect of income of families in an area to the import of crime is subject to diverse interpretations, but the single most important determinant of imported crime is the proportion of non-residential opportunities for crime within an area, primarily business crime (Smith, 1972:82). As Smith notes, this suggests that non-residential crime is much more profitable to offenders than is residential crime; for Raleigh, a census tract having ten percent more business opportunities than another tract increases its imported crimes by 1.76 (Smith, 1972:63). Further confirmation is found in the fact that crimes committed by offenders against victims in the area where they reside-- domestically or locally produced crimes-- are much more likely to involve residences than businesses as compared with exported crimes. (Smith, 1972:82).

This suggests, as Smith notes, that residential crimes may be committed close to the residence of the offender because the payoff for residential crimes may generally be insufficient to cover actual or opportunity costs (Smith, 1972:83). The fact that a substantial proportion of residential crimes are committed by juveniles who live in low income areas, and on foot, should net a lower average property value for property offenses that are localized by place of residence of victims and offenders (Repetto, 1974: 23)). Business crimes, which are more likely to be a substantial proportion of all imported or exported crime, should have on the average greater payoff. Yet Pope (1977:29-30) found no significant differences in the average value of property stolen in residential as compared with nonresidential burglaries.

Whether the substantial effect that income has on the production of offenders and offenses exists generally for communities is not known. One

would expect variation among communities, however, given patterns of residential segregations and social heterogeneity. If what Smith observes holds more generally, then increasing incomes could have a substantial effect on domestic and export production of offenders and offenses in urban communities, since increased income should lower the demand for illegal income transfers (Smith, 1972:81-82).

2. The risk of victimization from any crime varies inversely with the prevalence of organization of units at risk.

The burglary rate for the more frequently occurring household units is substantially lower than that for the less frequently occurring non-residential or business establishment. The NCS reports a 1973 burglary rate of 204 per 1,000 business establishments but only 93 per 1,000 households (NCJISS, 1976:68). Hindelang (1976:269-318) similarly found that in eight American cities, the burglary rate was 480 per 1,000 businesses but only 137 per 1,000 households. Conklin and Bittner (1973:212) likewise report discrepant rates for a Boston suburb: 217 for nonresidential as compared with 22 for residential locations. Earlier, Reiss (1966b:66) found that the 1965 U.S. burglary rate was 10 times greater for non-residential than for residential structures in Chicago.

The risk of victimization by robbery is greater for commercial establishments than for persons in households. The NCS reports a 1973 robbery rate of 7 per 1,000 persons 12 years of age and older but a robbery rate of 39 per 1,000 commercial establishments. Comparable estimates for the eight American cities reported by Hindelang (1976:107-318) are 8 per 1,000 persons and 90 per 1,000 commercial establishments.

Comparable rate data unfortunately are lacking for public organizations

such as schools. One can infer from published data that the burglary rates are probably higher for schools than they are for other nonresidential establishments. Thus Pope (1977:23) found that three percent of all burglaries for six metropolitan law enforcement areas of California were against schools; given the proportion that schools are of all establishments, their rate appears substantially greater than that for residences or commercial establishments. Within central cities of major metropolitan areas, rates of vandalism appear to be higher against schools than against other organizations.

The offense of larceny shows a similar pattern, though a fully comparable set of data is not available. The NCS reports a 1973 personal larceny with contact (purse-snatching and pocket-picking) rate of 3 and a personal larceny rate without contact rate of 90 per 1,000 persons, while the household larceny rate is 109 per 1,000 households. Though comparable data are not available, estimates of shop-lifting and employee theft indicate a much higher larceny rate for commercial establishments.

The risk of victimization for comparable offenses then seems less for persons than for organizations and among organizations seems greatest for those that are least frequent in the population of organizations.

There undoubtedly are a substantial number of factors that determine risk of victimization and little is known about most of them or their contributions to risk. Many of these determinants also can be regarded as elements of a unit at risk. Thus, for crimes against the person blacks are more at risk than are whites, men more than women, single more than married persons, and young more than old persons (NCJIS, 1976:18-21) and for crimes against households, unoccupied dwelling units are more at risk than are occupied

dwelling units for burglary and household larceny. Yet, young, single men, for example, are more likely to engage in behavior that increases their risk of victimization and offenders are prone to select unoccupied rather than occupied dwelling units for their offenses or to select single victims in occupied premises. Below we examine some of these elements in risk, particularly as they relate to crimes of stealth.

3. Except for offenses that are defined by their location, e.g., residential or commercial burglary, the risk of victimization is greater outside the victim's residence than within, concentrated in public ways and places. The risk of victimization outside is greater away from than near one's residence.

Undoubtedly both victim and offender behavior enter into the determination of place of occurrence of offenses. Offenders to some degree calculate risks in their selection of victims and the places to commit an offense while victim behavior may have elements of proneness and precipitation of offenses as well as differences in exposure.

Even for major crimes against the person, the probability of victimization is greater outside than within the victim's home. In the aggregate, personal crimes of violence occur most frequently outdoors, 48 percent (NCJIS, 1976:43). Among the three NCS major crimes of violence, rape (29 percent) is most likely to occur in the victim's home while robbery and assault occur with equal frequency in the victim's home (11 percent) (NCJIS, 1976:43). Although the NCS underenumerates crimes between persons known to one another, the findings for crimes known to the police show on the whole a similar pattern, though the rates for crimes committed within the home are somewhat higher. Thus, Mulvihill, et.al., (1969:221) re-

porting on place of occurrence of four major crimes against persons that were known to the police in 17 U.S. cities, found that outside locations were more common for willfull murder, aggravated assault, and armed and unarmed robbery. Their findings disclose only a majority of forcible rapes occur inside a residence. Amir (1971:144-149) similarly finds a majority of rapes occur inside a victim's residence but reported variation by initial meeting place and place of occurrence of rapes reported to the police. When the meeting place was at the offender's residence, all of the rape offenses occurred there while when the original meeting place was the victims's residence, 88 percent of the rape offenses occurred there. (Amir, 1971:145). Even correcting for NCS underenumeration of rape and assault offenses where the victim and offender are known to one another, however, a majority of rape offenses appear to occur outside the victim's home, though inside locations predominate over outside locations for rape. While one in 10 robberies against persons occur inside the home (NCJIS, 1976:93), both armed and unarmed robberies occur predominantly in outside locations (Mulvihill, et.al., 1969:221). Armed robberies, however, are much more likely to occur in inside locations of commercial establishments than are unarmed robberies (Mulvihill, et.al., 1969:221).

Personal larceny with contact—purse-snatching and pocket-picking—rarely occur in the victim's residence and take place largely in nonresidential buildings or on the streets; purse-snatching is more common as a street offense (NCJIS, 1976:43).

Personal larceny without contact is twice as common for nonresidential as for residence locations (NCJIS, 1976:67). Almost one-half of all personal larcenies without contact occur in public ways or places and another one-fourth occur within school buildings (NCJIS, 1976:Table 51).

Motor vehicles are rarely stolen within the person's place of residence (garage within or as part of a residence). Vehicles parked near one's residence account for 30 percent of all motor vehicle thefts in 1973 but the majority (64 percent) were stolen in public ways or places or from parking lots (NCJIS, 1976:Table 49).

4. Except for offenses defined by their location, crimes involving assault upon the person occurring in or near the person's place of residence occur more frequently within than near the residence while all other offenses are more likely to occur near than within the person's place of residence.

Homicide, aggravated assault, forcible rape and armed and unarmed robbery are more likely to occur within than near the home (Mulvihill, et.al., 1969:221; NCJIS, 1976:Table 48). The differences are substantial only for homicide and rape, however, In the aggregate, 12 percent of all personal crimes of violence occurred inside the victim's place of residence and 9 percent near it (NCJIS, 1976:Table 48).

Though personal larceny with contact occurs infrequently in or near the victim's place of residence (6 percent of all such offenses), it is about twice as likely to occur near as within the victim's place of residence (NCJIS, 1976:Table 48). Motor vehicle theft, as already noted, occurs rarely for vehicles housed with a person's place of residence but 30 percent are stolen when parked near the person's place of residence. While it appears reasonable to assume that much of the motor vehicle theft that occurs near the victim's residence is due to the absence of secure space to park the motor vehicle with the residence, some undoubtedly is due to the fact that victim's do not always use their facilities.

5. Among property offenses defined by their structural location, particularly burglary, the risk of victimization is substantially reduced by the presence of victims.

The relationship between occupancy of residences and risk of victimization is complex. Considering all areas within the Boston Metropolitan Area studied by Reppetto, areas with low daytime occupancy did not differ significantly in their burglary rate from areas with much lower daytime occupancy rates (1974:49). Nonetheless, Reppetto found that the large majority of dwelling units are unoccupied at the time they are burglarized and persons who leave their houses unoccupied for 35 hours or more a week were significantly more often burglary victims than those who left them unoccupied five hours or less a week; a similar relationship was found by number of hours a residence is occupied each day (1974:61,149).

The explanation for this difference between individual and area risks probably lies in part in offender concentrations and their selection of victims. Areas with low occupancy rates during the day vary in their production of offenders. Where local offender resident rates are low, offenders must move to the low occupancy opportunity.

The extent to which a dwelling unit is occupied is determined in part by household labor force participation rates. When women work, the household is more likely to be unoccupied. Evidence that labor force participation rates of women affect victim risk is provided by Pope using area correlations for selected California cities. Pope found that most reported burglary incidents took place in low socio-economic status areas but that reported burglaries were less likely to take place in areas with a low per-

centage of females in the labor force (Pope, 1977:27). One might speculate that as both the proportion of households with female heads who work and of households where both spouses work increases, area differences will reduce in magnitude. The increasing suburban rate of burglary, for example, may depend upon labor force participation patterns that increase the risk of victimization.

Offenders show a propensity to avoid occupied dwelling units. The selection of victims by burglars seems to be in marked contrast to that of offenders who commit robbery. Conklin (1927:87-88) concluded that offenders who choose robbery prefer confrontation to stealth and Roebuck and Cadwallader (1967:380-81) observed that black robbery offenders took pride in taking property by force against persons.

The proportion of persons present when offenses of burglary, larceny without contact, or motor vehicle theft are committed is quite low--less than one in ten. For the offense of burglary, Pope (1977:26) found that the victim was present during 7.4 percent of all residential and commercial burglaries and found it in progress in an additional 1.5 percent of all burglaries. Data from the National Crime Survey disclose that the burglary victim was able to describe some characteristics of the offender in only 2 percent of all burglaries with forcible entry where property was taken but in 12 percent of all burglaries where there was forcible entry but no property was taken; rates for unlawful entry (7 percent) and attempted burglary (9 percent) were somewhat lower (Reiss, 1976:Table 1). NCS victimization data similarly show that the victim was able to describe the offender in three percent of all actual larcenies without personal contact but in 18 percent of all such attempted larcenies (Reiss, 1976:Table 1). For motor vehicle theft, victims described offenders in four percent of all

actual thefts but in 9 percent of all attempted auto thefts and 21 percent of all other motor vehicles. Quite clearly, victim presence is related to the success offenders have in committing offenses. When the victim is present, more attempts are thwarted and evidence obtained about the offenders. Still a great many other factors other than presence of the victim influences whether an offender is successful in committing a crime since even most attempts go undetected as they occur.

Property offenses are clearly crimes that are usually discovered after either the attempt or the completion has taken place. A recent study of response time to major crimes discloses that major property crimes are usually not discovered in progress or by alarms but that they are discovered by victims, on the average much later than the estimated time of occurrence of the offense (KCPD, 1977). Pope (1977:26) similarly found that burglary offenses were most usually discovered after the victim returns (57 percent) or the next working day (primarily commercial burglaries), an additional 18 percent. The presence of a victim during the burglary (7.4 percent), the victim returning (1.5 percent), detection by burglar alarm (3.3 percent) or discovery by a passing patrolman (2.1 percent) accounted for only 14.3 percent of all burglaries known to the police. That considerable time may elapse before the offense is discovered is evident not only in the Kansas City Police Department Response Time Study (1977) but in attempts to pinpoint the time of occurrence of the burglary from victim reports. A sizeable minority of respondents are unable to even estimate the time period when the offenses of burglary and household larceny occur. Respondents for the National Crime Survey could not estimate time of occurrence for 23 percent of all burglaries (somewhat lower for forcible than other forms of entry or attempts to burglarize) and for 21 percent of

all larcenies from households; time of occurrence was not reported for 9 percent of all commercial burglaries (NCJISS, 1976:Table 45).

Nonresidential burglaries appear to occur largely when no one is present, though support for this conclusion is inadequate. Apart from the fact that many burglary offenses against commercial establishments are discovered on the next working day, information on the time of occurrence of nonresidential burglaries indicates they are most likely to occur at night and over the week-end, times when nonresidential buildings are usually unoccupied (Scarr, 1973:104; Clarke, 1972:11; Conklin and Bittner, 1973:215; Chimbos, 1973:324). Victimization surveys disclose that commercial burglaries are more frequently reported as occurring at night than are residential burglaries. For the National Crime Survey, 85 percent of all commercial burglaries were reported as taking place between 6 P.M. and 6 A.M. (NCJISS, 1976:42) and in the eight cities studied by Hindeland, it was about 90 percent (1976:335). Only somewhat more than one-half of all residential burglaries were reported as taking place at night in the national victim surveys.

6. Victims are prone to repeat victimization by the same type of crime and spatial location.

The chances a household or one or more of its members will be successively victimized by the same type of crime are greater than one would expect given the chances of victimization for all households and their members. The chances of being victimized by a burglary, household larceny, motor vehicle theft, or any major type of crime against the person are greater if the previous victimization was the same type of crime than some other type of crime (Reiss, 1977c: 17). This is not to say that whenever a household or one of its members is

victimized by any type of crime, it has a greater chance of next being victimized by that same type of crime than by some other type of crime since the probabilities of victimization for any type of crime depend upon the relative frequency of occurrence of that type of crime. Thus ones chances of being victimized by frequently occurring crimes of burglary, household larceny, personal larceny without contact, and assault are high regardless of the type of crime in a previous victimization, but they are substantially greater for these offenses if the previous crime victimization was the same type of crime. For the offenses of motor vehicle theft, rape, robbery and purse-snatching or pocket-picking the chances of next being victimized by the same type of crime are greater only if one was previously victimized by that same crime.

Considering only household crimes--burglary, household larceny, and motor vehicle theft--there is a substantial propensity for victimization by the same type of household crime. The chances of being victimized by any type of household crime are greater if the previous victimization was the same type of household crime than some other type of household crime. Indeed, a burglary with a forcible entry was more likely to occur if it were preceded by a burglary with forcible entry, burglaries without force when preceded by one without force, and attempted burglary when preceded by attempted burglary. The same is true for type and amount of household larceny and for actual and attempted motor vehicle theft (Reiss, 1977: Table 8a). These propensities to repeat victimization by the same type of crime cannot be attributed to the crime rates of areas.

Though the place of occurrence of an offense is related somewhat to type of crime, there similarly is a propensity for repeat victims to be

victimized in the same type of place. Thus if one is victimized at home, one is most likely to be victimized next at home and if near home, to be victimized next near home. Young persons victimized in school are highly likely to be victimized next inside the school. The propensity is similarly large for street offenses (Reiss, 1977:Table 6).

7. The more residentially dispersed nonresidential structures, the greater their risk of victimization and the less amenable to control of crime.

The typical pattern of urban and rural growth of communities in the United States has led to considerable dispersion of nonresidential structures, particularly of commercial establishments. These patterns are in sharp contrast with those of more recently planned suburban communities where nonresidential buildings have a greater concentration. Within large cities and rural fringe areas, businesses are located in dispersed ribbon developments rather than concentrated in space. Such dispersal limits the extent to which they can be controlled by direct surveillance. Though data are generally lacking, nonresidential structures that are dispersed in space have a greater risk of victimization than those that are concentrated in space.

Environmental Control of Offending

Environmental control of offending exists in two major and related forms. There are, first, environmental and situational factors that restrict opportunities to commit offenses. While these factors are subject to direct influence and change, they typically inhere in situations because of their structure or in patterns of social behavior. These types of control range from patterns of occupancy of structures and movement by victims to situational opportunities that facilitate entry by offenders or limit their access. The second class of environmental control includes technological and social practices that facilitate detection of offenders as they go about committing crimes. The former are often regarded as preventive strategies or deterrents to crime while the latter are techniques of detection. The distinction between the two types of environmental controls is far from clear. To illustrate by example, a burglar alarm may both deter some offenders and operate as a means of detecting offenders while an offense is being committed.

Methodologically, it is difficult to disentangle the relationship among specific forms of environmental control and the probability of either victimization or offending. This is so for a number of reasons. First, it is difficult to measure the effect of measures that thwart, avert, or prevent offenses. To do so requires far more information on how offenders and potential offenders are deterred than is currently available. Second, it is difficult to determine the specific effect of any form of control since forms of control commonly occur in conjunction with one another. Thus a residence, for example, may have low daytime occupancy, a dog, and a variety of security devices that restrict access. The effect of any one of these on crime

prevention is not easily measured; to do so would require large populations that permit analyses of separate effects. Third, controls vary considerably in the range of their effectiveness. Access to a structure may be restricted at some times and not others, for example. A burglary with unlawful entry thus may be more likely to occur when the structure is accessible to the public while forcible entry will be required when it is closed. Any generalizations about environmental controls and their effectiveness on risk of victimization thus are quite tenuous from a methodological point of view.

At the same time, the theory of environmental control and deterrence is poorly developed so as to explain patterns of offending. Some theories are based on essentially rational postulates of offending, assuming that offenders and their victims behave rationally in their environment and calculate risks of victimization or detection when offending. There is ample evidence that offenders quite commonly are also victims but little is known whether rational calculation enters into these separate roles (Savitz, et.al., 1977:59). Indeed, some assume that environmental controls often can increase the rational calculation of offenders and their sophistication in committing offenses by displacing offending to alternate opportunities. Still other theories assume less rationality in victim and offender behavior. Such theories may emphasize the effects of environment on detection rather than deterrence or the causal effect of victim precipitation in offending. Among the various theories, there are contradictory predictions about effects of controls but the difficulty and lack of testing these predictions precludes choosing among the theoretical explanations.

Given these theoretical and methodological limitations, any observations about the deterrent or detection effects of environmental controls are

suspect. We offer a few that emerge from our current review.

1. Direct and personal control of environmental opportunities and situations reduces the risk of victimization and deters offending more than indirect impersonal means.

We noted previously that the presence of potential victims reduces the risk of certain property offenses such as burglary, household larceny, and motor vehicle theft. Moreover, Reppetto (1974:83) and others show that burglary rates are substantially lower where guards limit access to high-rise luxury apartments (though usually such buildings also have elaborate surveillance devices). Excepting some offenses of public order, only a very small proportion of any criminal offense occurs in the presence of law enforcement or security officers, a result undoubtedly both of chance and deterrence. Though evidence on whether the presence and surveillance of neighbors reduces the risk of victimization is generally lacking, burglary offenders report that the presence of potential witnesses and neighbors deters them (Reppetto, 1974:14-17,24).

Generally, the less direct the supervision or surveillance, the greater the theft rate. The less the supervision of employees, for example, the greater the rate of employee theft (Merriam, 1977:391-92). Though much shop-lifting occurs in the presence of others, shop-lifters seek to avoid direct surveillance by employees (Cameron, 1964).

Much crime against persons occurs in public places or byways. Offenders most commonly select persons who are alone and the risk of victimization is generally greater for single than married persons in stranger-to-stranger offenses. It is surprising how few major or minor offenses occur when persons

are in motor vehicles, even when a person is alone. Citizens who confine their behavior to being about with others or in private transport seem particularly invulnerable to victimization by strangers. They become vulnerable in moving to means of transport or when confined to movement on foot. The elderly appear to be particularly vulnerable to juvenile offenders when on foot. To be sure, certain offenses such as pocket-picking may be quite likely in crowds, but such crimes of stealth are not ordinarily regarded by potential victims as matters for direct surveillance and control.

No adequate data are available on how direct control affects risk of robbery. Victims of robbery are less likely to be alone than are other victims of major crimes against persons, except for rape and homicide. Robbery victims and those victimized by serious assault with theft are least likely to report being alone in the NCS (Reiss, 1976:Table 1). Comparable data are not available for commercial robberies but it appears that the risk of robbery is greater for lone attendants.

The control that victims exercise over access clearly affects the risk of victimization for some offenses. Among all burglary victimizations reported in the U.S. in 1973, about half as many were committed by unlawful as by forcible entry (NCJIS, 1976:Table 1). Personal control over access, such as in luxury high-rise apartments, appears to have the greatest deterrent effect on burglary.

It is believed that situational factors which affect the public visibility of structures deters property offenders. Pope (1977:28), for example, reports that the point of entry was not visible in 70 percent of all burglaries. Nonetheless, assuming that the back and sides of structures are the least visible (and more likely to be shielded by landscaping, fences,

etc.) and the front is most visible, there is a one in four chance that the more visible front will be the point of entry. The 30 percent visible entry reported by Pope is not much difference from this chance expectation.

Similarly, while the point of entry was not lighted in 69 percent of all reported burglaries (Pope, 1977:28), lacking information on the distribution of lighted and unlighted entries by place on structures, it remains unclear whether lighting has any appreciable effect. Indeed, the availability of lighting within 100 feet of the point of entry characterized 69 percent of all burglaries (Pope, 1974:28), though again the distribution of lighting to property access risk is unknown.

Alarm systems are utilized both as a deterrent and as a means of detection. Alarms are uncommon for residences (Pope, 1977:39) but they seem to have a significant deterrent effect for nonresidential structures by increasing the proportion of attempted as compared with actual burglaries (Pope, 1977:41). Yet Pope also reports that alarms failed to operate in one-half of all reported burglaries (1977:28) and Conklin and Bittner found that 39 percent failed to function (1973:223-24). The extent to which failure to operate is owing to system failure as compared with offender sophistication in circumventing them is not known, but Reppetto (1974:18,24) reports that younger burglars said they were more likely to be deterred by alarms than did older ones.

The relationship between ownership of firearms as a means of protection and risk of victimization is unclear. Firearms are reported stolen in both residential and nonresidential burglary, but victims are not generally present to use them when residential burglary takes place. For the one in ten burglaries where a resident is present during the burglary, no evidence is



CONTINUED

4 OF 7

reported that firearms had any effect on the burglary such as increasing the proportion of attempted burglaries or of arrests for burglary. No adequate data similarly are available for robberies, though there are police reports of victims using firearms in business robberies. Overall, given the levels of gun ownership reported for the population, it is doubtful firearms have much deterrent effect on offender behavior or in reducing the risk of victimization by crime, particularly for property crimes.

The effect of locks and other means of securing residential and non-residential structures likewise is unclear. It is commonly assumed that security measures that restrict access have some effect on crime rates. They clearly have an effect in burglary on the means of entry used by offenders, whether forcible or not, but it is difficult to assess any specific effect on rates, given their common occurrence with other means of control.

2. Experience with victimization by crime increases the propensity of victims to change their behavior or environment to potentially decrease opportunities for victimization by crime.

2a. The higher the actual rate of victimization by personal or household crimes, the greater the propensity of victims to change their place of residence.

Victimized persons and households show a substantially greater propensity to change their residence than do nonvictimized persons and households regardless of place of residence. The major findings are summarized below (Reiss, 1977b:ii-v).

(1) The higher the multiple victimization of persons or households, the greater the propensity to move within six months following victimization. There is a 75 percent increase in the move-out rate from persons reporting a single victimization to those reporting four or more victimizations within

a six-month period. The move-out rate of households first reporting five or more household victimizations within a six month period is twice that of households reporting only a single victimization.

(2) The residential mobility rate of persons increases with the seriousness of the victimization. While residential mobility increases with the seriousness of crimes against persons and the amount of victimization, as the level of multiple victimization increases, the rate of residential mobility increases for each major type of crime against persons.

(3) The household crime of burglary has a somewhat higher rate of residential mobility than do the household crimes of larceny from the household and motor vehicle theft, but the differences in propensity to move among household crimes is smaller than among major crimes against persons.

(4) As the level of multiple household victimization increases, the rate of residential mobility increases irrespective of type of household crime. The level of multiple household victimization appears more important in the propensity of households to move than does the type of household crime.

The substantial propensity of highly victimized persons and households to move may be related both to victim motivation to move to a less crime prone environment and to their inability or lack of motivation to take other measures to control their chances of victimization. It is possible that tenants in high crime rate areas are more prone to move following multiple victimization than are owners, given the rapidity with which residential moves follow high victimization. Tenants have both greater options to move quickly and less control over the security of their situation, at least for household crimes.

2b. Actual experience of victimization by crime increases the pro-

pensity of victims to alter their environment or behavior within it to decrease their risk of victimization by crime.

Victimization by property offenses increases the likelihood that victims will take additional security measures to reduce their risk. Victims of residential burglary are more likely to take additional security measures such as installing locks (43 percent) than are nonvictims (19 percent) and the majority of residential burglary victims attribute these changes to their actual experience as victims (Repetto, 1974:64). Such changes in security practices appear to reduce the risk of victimization by residential burglary since those who changed security practices had substantially lower rates of multiple victimization by burglary than those who did not (Repetto, 1974:64). The long-run effect of such changes has not been assessed, however. Comparable data are lacking for offenses against nonresidential establishments but Merriam concludes that some security measures taken by commercial establishments have a deterrent effect on employee theft (1977:,398-99).

Persons who reside in high crime rate areas and households with low income are most likely to alter behavior to reduce the risk of victimization by crime (Savitz, et.al., 1977:60-61; Biderman, et.al., 1967:131). Measures taken for self-protection are more likely to involve changing behavior patterns than to secure one's person or property (Biderman, et.al., 1967:130; Savitz, et.al., 1977:60). Staying off the streets at night, avoiding being alone at night or talking to strangers, and using taxis are the most frequently chosen ways to alter behavior to reduce risk of victimization. Citizens report taking such measures to reduce their victimization by crime away from home, particularly crimes against their person which they report arouses greater anxiety in them. Even though victimization is far more

common for property than for person, citizens are less likely to take security measures to reduce victimization from property crimes than they are to change their behavior to reduce victimization from crimes against their person (Biderman, et.al., 1967:128-32; Savitz, et.al., 1977:60). Some changes in behavior, of course, may reduce the risk of both person and property crimes, such as staying home at night.

There appear to be some differences in the way adults as compared with their children alter behavior as a result of experience with and fear of victimization. Both black ghetto parents and their children appear equally likely to change their behavior by avoiding strangers, staying home at night, and going out alone, or, in the case of juveniles, avoiding gang territory. They likewise are more likely to take these forms of risk reduction than to secure their place or person. Yet, children tended to engage in fewer forms of avoidance and more often to secure their person than did their parents (Savitz, et.al., 1977:60-61).

2c Fear of victimization increases with actual experience with victimization, while concern for the epidemic nature of crime increases with opposition to social changes socially perceived as causing an increase in crime.

Furstenburg (1971:603) distinguishes between fear of victimization and concern for crime as a social problem. Fear of victimization is measured by a person's perception of his or her chances of victimization by crime while concern for crime as a social problem is a function of a person's perception of the seriousness of crime as a social problem and his/her orientation toward social change.

Concern for crime as a social problem is unrelated to an individual's perception of his or her vulnerability to eight different types of crime (Furstenburg, 1971:604). Moreover, as actual risk of victimization decreases,

concern about crime goes up. People in low crime areas were significantly more concerned about crime as a social problem than were those who lived in high crime rate areas (Furstenburg, 1971:605).

Concern for crime as a social problem was significantly related to a citizen's commitment to the existing social order and his or her opposition to changing social conditions, particularly those associated with race equality. Those most committed to the changing social order were least concerned about the seriousness of crime as a social problem while those who were most opposed to changing the situation of blacks in the United States were most concerned (Furstenburg, 1971:606). Fear of victimization by crime was substantially related, however, both to actual crime rates in one's area of residence and to one's estimate of safety from victimization by crime in the neighborhood of residence. The higher the crime rate and the less safe a person perceived his or her neighborhood, the greater the fear of victimization by crime (Furstenburg, 1971:607-08). Biderman, et.al. (1967:125) did not find fear of crime was as closely related to the actual crime rate in an area as to a person's perception of the safety of his or her precinct. They suggest that when people live in neighborhoods where in the aggregate there is pronounced fear and anxiety about crime, the citizens are more likely to fear victimization, regardless of objective conditions of risk of victimization.

. . . A recent study of actual experience and its effect on fear of victimization found that parents were more likely to be fearful as a result of their victim experience than were their children because of their experience. This is in part owing to the fact that parents are fearful of the safety of their children as well as of their own safety (Savitz, et.al., 1977:60). Juveniles were very likely to consider the environment outside their home

as dangerous. The major areas more than half of all black ghetto youth feared were the streets more than a block from their home, subways, parks, and the streets going to and from school. Only somewhat less than one-half regarded the school yard as a dangerous place (Savitz, et.al., 1977:60).

The relationship between actual victimization, fear of victimization, concern for crime as a social problem, and the measures taken to alter or change one's environment or behavior to reduce risk of victimization by crime undoubtedly is more complex than the above propositions state. What measures one takes is related not only to one's actual experience with victimization and anxiety or fear of victimization, but the nature and type of crime experience are probably important as well.

Conclusion

Our major goal has been to offer some propositions about offender selection of victims, victim proneness to victimization by crime, and environmental control of offending as they relate to environmental determinants of crime. We shall not attempt to summarize those propositions here but rather to offer a few general inferences based on these propositions.

There is good reason to assume that the opportunities for offending and for victimization by crime as well as environmental proneness to crime far exceed the proportion of offenders in the population and their aggregate capacity to offend. There undoubtedly is, therefore, a great deal of chance in who is victimized, when, and where. At the same time there is some structural and location proneness to victimization that is determined by environmental conditions and amenable to control, particularly in repeat victimization by crime.

On the whole, the major environmental factors that affect risk of

victimization by crime are the more macroscopic features of communities, features that determine both the prevalence of offenders and their incidence of offending as well as the risks they assume. Whether these are structural features of communities or patterned social relationships that inhere in the structure of work, residence, and leisure, they are not easily amenable to individual efforts at crime control. Such environmental conditions often reduce the opportunities for public control through surveillance as well.

Where individuals can exercise environmental control, they appear more likely to exercise that control by changing their location or their behavior than by taking measures that secure their person or places. This is so despite the fact that risk of victimization of households is far more likely than that of persons. Were individuals to substantially increase measures of security, it is unclear whether they can substantially alter their risk of victimization. Changes in residence and behavior could be more effective but they involve higher actual and opportunity costs. Given substantial elements of chance in victimization by crime and the limited effectiveness of any security measure in reducing either offending or risks to offenders, the trade-offs between losses from victimization and costs of reducing the risk of victimization are not easily calculated. That may be why actual experience of repeat victimization may be a major factor in taking measures to reduce risk of victimization.

REFERENCES

- Amir, Menachem
1971 Patterns in Forcible Rape. Chicago: University of Chicago Press.
- Biderman, Albert D., Johnson, L.A., McIntrye and A. W. Weir
1967 Report on A Pilot Study in the District of Columbia on Victimization and Attitudes Toward Law Enforcement. Field Survey I, A Report to the President's Commission on Law Enforcement and the Administration of Justice. Washington, D.C.; U. S. Government Printing Office.
- Boggs, Sarah L.
1965 "Urban Crime Patterns". American Sociological Review 30: 899-908.
- Cameron, Mary Owen
1964 The Booster and the Snitch: Department Store Shoplifting. New York: The Free Press.
- Chimbos, Peter D.
1973 "A Study of Breaking and Entering Offenses in 'Northern City' Ontario". Canadian Journal of Criminology and Corrections 15: 316-25.
- Clarke, Steven H.
1972 Burglary and Larceny in Charlotte-Mecklenburg: A Description Based on Police Data. Mecklenburg, N.C.: The Mecklenburg Criminal Justice Planning Council.
- Conklin, John E.
1972 Robbery and the Criminal Justice System. Philadelphia, Pa.: Lippincott.
- Conklin, John E. and Egon Bittner
1973 "Burglary in a Suburb". Criminology 11:206-32
- Eustenberg, Jr., Frank F.
1971 "Public Reaction to Crime in the Streets", The American Scholar 40:601-610.
- Goodman, L., Miller, T. and P. DeForest
1966 A Study of the Deterrent Value of Crime Prevention Measures as Perceived by Criminal Offenders. Washington, D. C., Bureau of Social Science Research.

Hindelang, Michael

1976 Criminal Victimization in Eight American Cities: A Descriptive Analysis of Common Theft and Assault.
Cambridge, Mass.: Ballinger.

Kansas City Police Department (KCPD)

1977 Response Time to Part I Crimes. Report to the National Institute of Criminal Justice and Law Enforcement, Law Enforcement Assistance Administration, U. S. Dept. of Justice.

Merriam, Dwight H.

1977 "Employee Theft". Criminal Justice Abstracts. 9:375-406.

Mulvihill, J.D., Turner, M.S. and Lynn A. Curtis

1969 Crimes of Violence. A Staff Report Submitted to The National Commission on the Causes and Prevention of Violence. Washington, D.C.: U.S. Government Printing Office, Vol. II.

National Criminal Justice Information and Statistics Service (NCJIS)

1976 Criminal Victimization in the United States: 1973. U. S. Department of Justice, Law Enforcement Assistance Administration (December). Washington, D.C.: U. S. Government Printing Office (1977).

Normandeau, Andre

1968 Trends and Patterns of Robbery: With Sepcial Reference to Philadelphia, Pennsylvania, 1960 to 1966. University of Pennsylvania, Ph.D. dissertation.

Pope, Carl E.

1977 Crime Specific Analysis: The Characteristics of Burglary Incidents. U. S. Dept. of Justice, Law Enforcement Assistance Administration, National Crimonal Justice Information and Statistics Service. Washington, D. C.: U. S. Government Printing Office. Also, Utilization of Criminal Justice Statistics Project, Analytic Report b, Criminal Justice Research Center, Albany, New York.

Repetto, Thomas A.

1974 Residential Crime, Cambridge, Mass.: Ballinger.

Reiss, Jr. Albert J.

1966a "Place of Residence of Arrested Persons Compared with Place Where the Offense Charged Occurred for Part I and Part II Offenses". Report of the President's Commission on Law Enforcement and the Administration of Justice. Crime Statistics Series #5 (August 12).

- 1966b Studies in Crime and Law Enforcement in Major Metropolitan Areas. A Report to the President's Commission on Law Enforcement and the Administration of Justice. Field Surveys III, Vol. I. Washington, D.D.: U.S. Government Printing Office.
- 1976 "Patterns of Offending in Crime Incidents: Size of Offending Groups and Age of Offenders Involved in Major Crime Incidents Reported by Victims in the National Crime Survey". Analytical Studies in Victimization by Crime; Data Report #1. Law Enforcement Assistance Administration Grant #75 SS-99-6013 (November).
- 1977a "Repeat Victimization of Persons and Households in the National Crime Survey". Analytical Studies in Victimization by Crime, Data Report #4. Law Enforcement Assistance Administration Grant # 75 SS-99-6013 (March).
- 1977b "The Residential Mobility of Victims and Repeat Victims in the National Crime Survey". Analytical Studies in Victimization by Crime, Data Report #5. Law Enforcement Assistance Administration Grant #75 SS-99-6013 (March).
- 1977c "Victim Proneness by Type of Crime Victimization Over Time". Analytical Studies in Victimization by Crime, Data Report #7. Law Enforcement Assistance Administration Grant #75 SS-99-6013 (November).
- Roebuck, J.B. and M. L. Cadwallader
1967 "The Negro Armed Robber as a Criminal Type: The Construction and Application of a Typology". In Marshall Clinard and Richard Quinney (Eds.). Criminal Behavior System: A Typology. New York, N.Y.: Holt, Reinhart and Winston.
- Santa Clara Criminal Justice Pilot Program (SCCJPP)
1972 Burglary in San Jose. Springfield, Va.: U.S. Dept. of Commerce.
- Savitz, Leonard D., Lalli, Michael and Lawrence Rosen
1977 City Life and Delinquency-Victimization, Fear of Crime and Gang Membership. National Institute for Juvenile Justice and Delinquency Prevention, Office of Juvenile Justice and Delinquency Prevention, U.S. Dept. of Justice. Washington, D.C.: U.S. Government Printing Office

- Scarr, Harry A.
1973 Patterns of Burglary. Washington, D. C.: U. S. Government Printing Office. 2nd edition.
- Smith, Michael Wayland
1972 "An Economic Analysis of the Intracity Dispersion of Criminal Activity". North Carolina State University: Unpublished Ph. D. dissertation.
- Smith, Thomas Spence.
1976 "Inverse Distance Variations for the Flow of Crime in Urban Areas". Social Forces 54 (June): 802-815.
- Suttles, Gerald D.
1968 The Social Order of the Slum: Ethnicity and Territory in the Inner City. Chicago: Ill., University of Chicago Press.
- Tien, J. M., Repetto, T. and Hanes, L.F.
1976 Elements of Crime Prevention Through Environmental Design. Arlington, Va.: Westinghouse Electric Corporation.
- Turner, S.
1965 "Delinquency and Distance". Pp. 1- in Thorsten Sellin and Marvin Wolfgang (Eds.), Delinquency: Selected Studies. New York, N.Y.: John Wiley and Sons.
- Weir, Adrienne
1973-4 Feeney and Adrian Weir (Eds.) The Prevention and Control of Robbery. Davis, Ca.: University of California, Davis (Prepared for National Institute of Law Enforcement and Criminal Justice, Law Enforcement and Assistance Administration, U. S. Dept. of Justice)
- Wolfgang, Marvin
1958 Patterns in Criminal Homicide. Philadelphia, Pa.: University of Pennsylvania Press.

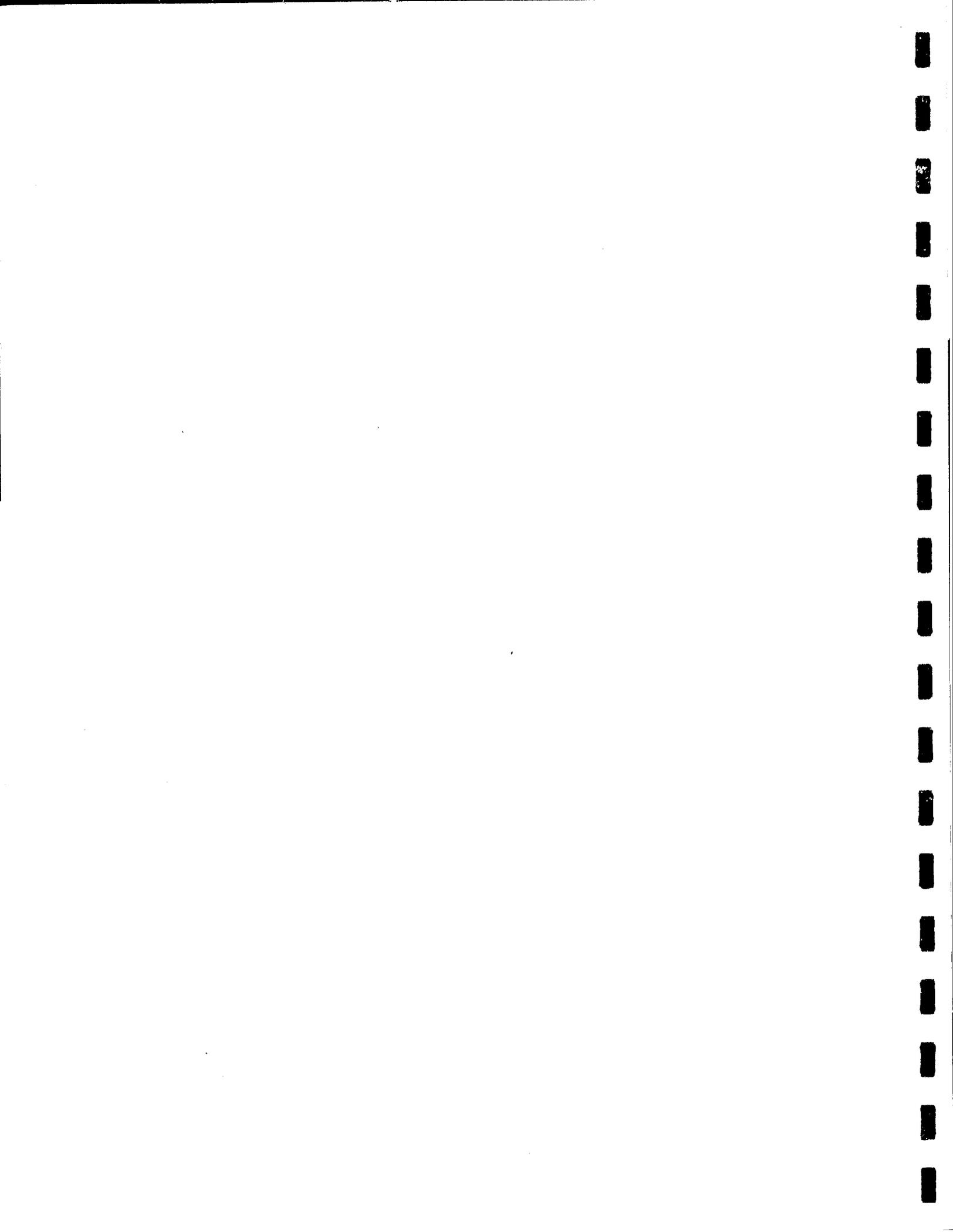
CRIME BY DESIGN:
SOME OBSERVATIONS FROM THE PAST

BY
THOMAS A. REPPETTO

SUBMITTED TO WESTINGHOUSE NATIONAL ISSUES CENTER:

CPTED PROJECT

MARCH 8, 1978



INTRODUCTION

In recent years criminologists, architects, planners and public officials have developed an interest in Crime Prevention Through Environmental Design (CPTED); a concept which has grown out of studies of the interaction between human behavior and the man-made or built environment. It has been hypothesized that the proper design and effective use of the built environment can lead to a reduction in crime and fear, and concomitantly, to an improvement in the quality of urban life.

In 1961 urbanologist, Jane Jacobs, in her influential work, The Death and Life of the Great American Cities, opposed the tendency of urban planning to divide the city into specialized districts along functional lines such as commercial, residential, or industrial. She argued instead for diversifying land use to create more street activity, thereby stimulating informal social controls and more citizen surveillance as a counter to crime.¹ Throughout the 1960's interest in CPTED grew. In 1972 the architect, Oscar Newman, propounded the concept of defensible space, i.e., spatial arrangements manipulated to alter social behavior in the interest of increased security. Newman argued that:

We are reasonably certain that the physical environment provided can directly result in attitudes and behavior on the part of residents which will ensure the security of that environment--will enable them to naturally undertake a self-policing role which will act as a very effective form of target hardening not prone to the changing modus operandi of criminals--and finally will make evident to prospective criminals the high degree of probability of their apprehension.²

Newman analyzed the way in which design factors such as high rise public housing and large undifferentiated open spaces create an impersonal environment conducive to crime. Contemporaneously a growing number of other studies have propounded a relationship between crime and urban design factors.³

In 1969 the National Commission on the Causes and Prevention of Violence assembled a panel of architects, planners, criminologists, and social historians to consider the relationship between violent behavior and the design and form of the urban environment. The panel examined historical and contemporary data and offered a number of conclusions and projections.⁺ Since the entire analysis covered only 25 pages, about one third of it historical, the panel obviously could not comment on a great deal of available material. Indeed, at the outset they imposed a rather severe limitation on their research. The panel noted that:

"Little attention has been paid to historical relationships between the design and form of the environment and violent behavior by scholars in architecture and urban design, except in peripheral ways, and then only in general terms..."
(Therefore)

⁺ The material covered in the commission report was also reproduced in an article by a staff member. See Robert Gold, "Urban Violence and Contemporary Defensive Cities," Journal of the American Institute of Planners, May 1970, pp. 146-159.

indirect evidence must be sought in the literature of other fields. In this chapter insights into the past use of urban environments were obtained from police histories."4

This decision had the effect of omitting a great deal of interesting and provocative material which might have been useful to present students of CPTED. In the first instance police histories are not necessarily the best source of information on crime since the two subjects are not synonymous. Studies of policing often concentrate on administrative aspects of the subject, almost to the exclusion of crime problems. It is also possible that histories of crime or police may not be as useful in appraising the broad concerns of CPTED as more general works dealing with past eras or locales; nor did the panels' necessarily brief treatment exhaust the range of available police histories.

It is the purpose of the present paper to expand on a portion of the material presented in the Violence Commission report by examining historical relationships between the design and form of the urban environment and predatory (though not exclusively violent) crime. No attempt will be made to replicate the panels' examination of contemporary data or to link these with the immediate concerns of the Violence Commission. Indeed, from this writer's perspective, the panel's mixing of historical, contemporary, and futuristic material in so brief a treatment tended to both confuse and weaken the analysis. For example, the panel report posited the specter of future cities being divided into fortified or geographically

remote "safe" enclaves, and neighborhoods which would be "human jungles," declaring that:

Crime in these areas would be frequent, widespread, and perhaps entirely out of police control, even during the daytime. These neighborhoods would be modern counterparts of the ...various districts of London during the 18th century.⁵

The panel recommendation appeared so cogent to the full commission that it was adopted by them in their final report and has since been widely quoted.⁶ However, a close examination of the data upon which the panel (and ultimately the commission) relied, suggests that their dramatic assertion rests on rather thin evidence. The panels' analysis of 18th century London comprised only half a page and was referenced to a single work by a modern English police historian. As a result it omitted some of the complexities of the crime situation in that period.⁺

The panel also attempted to cover a very wide scope, (Greek, Roman, Chinese and Medieval cities, etc.) The present paper will concentrate chiefly on London from the 16th century onward, with occasional reference to other western cities such as Paris, New York, Philadelphia and Chicago.

⁺ Charles Reith's, The Police Idea (London, Oxford University Press, 1938), propounds the thesis that a strong police force is essential to civilized life. Thus Reith tends to present the most alarmist view of the pre-police era (before 1829). While property crime was undoubtedly high, assault against the person was comparatively low in 18th century London, and though certain property crimes of violence such as robbery were prevalent in some districts of London, murder was not. See for example, Sir Leon Radzinowicz, History of the English Criminal Law and its Administration from 1750 4 volumes (London Stevens & Son, 1948-68) Esp. volume I, and Luke O. Pike, A History of Crime in England 2 volumes (London, 1873-76) esp. volume II.

The violence commission panel hypothesized three possible relationships between the design and form of the urban environment and violent behavior:

1. Design and form of the urban environment may control violence directly. Residential areas for example may be selected by a criterion of distance from populations with real or assumed propensities to commit violence. Buildings may be designed to include crime control features, perhaps with other social or aesthetic values subordinated or eliminated entirely.
2. Design and form of the urban environment may encourage positive forms of behavior. To the extent positive behavior is promoted, negative behavior-including violence-is prevented.
3. Design and form of the urban environment may invite violence. Buildings or open spaces may be negative symbols or may be attributed to other sufficiently neutral or negative values to such an extent that people are willing to destroy or deface them, or to use them as places to commit violent acts.⁷

In general, evidence for #1 was most prevalent. As the commission observed:

The history of cities from the Middle Ages to the present can be described as a sequence of changing defense perimeters. The comparatively small walled city, with sentries and gate keepers, protected everyone inside. General descriptions of life in medieval Europe suggest that criminals were driven out of cities whenever possible. They retired to forests and preyed on unprotected travelers. Cities were fortified by walls as much for protection from these domestic "enemies" as from foreign ones. In later years the larger city contained its own criminal quarters and demanded new forms of protection. The primary environmental units of defense against violence were individual buildings or dwelling units.⁸

Thus the panel report provides several starting points for our analysis. These are:

1. The recognition of distinct criminal quarters in cities.
2. The notion that a building or space may elicit positive or negative behavior.
3. The possibility of fortifying individual dwellings or other places.
4. The selection of residential areas for their distance from supposed criminal populations.

However, this brief formulation requires further clarification and expansion. For example the observation that criminal quarters have existed in cities leaves unexplained the relationship of urban design factors to the creation of such districts. Nor is it clear to what extent items 2,3, and 4 either contribute to crime or help to prevent it. For example the practice of selecting residential areas for their distance from supposed high crime areas is aimed at prevention but it might have the opposite effect by removing stable elements from particular neighborhoods.

The next section of this paper will examine the extent to which design factors may contribute to the problem of predatory crime. The following section will look at how design factors can be used to prevent crime, and the final section will discuss policy implications.

THE CREATION OF CRIME: ATTRACTORS, PRODUCERS, AND FACILITATORS

The Development of Criminal Districts

The identification of a district of the city as a criminal quarter is somewhat imprecise. As Morris has pointed out, mere

recognition of differential levels of crime among various city neighborhoods does not take into account differences between areas which produce crime, that is, contain a disproportionately high percentage of resident criminals, and those neighborhoods which attract crime.⁹ Thus a neighborhood may experience much crime but contain the residences of few criminals or vice versa. In contemporary times, for example, an upper income suburb may display a high burglary rate but contain no burglars.

In general London's "criminal districts" denoted areas where offenders both lived and worked. This was necessitated by the lack of any transport save feet and the advantages which territorial knowledge provided criminals.

How are criminal districts created? Even if we accept that criminals naturally seek the company of their fellows the question remains why do they congregate in particular areas. At least three explanations relate to facets of the built environment.

In the first instance criminals may be brought together by the location of certain physical facilities which in themselves are not inherently productive of criminal behavior. That is, they are not producers but may be seen as indirect attractors. The criminal quarters of medieval London tended to grow up in the vicinity of monasteries because they afforded sanctuary to fugitives. Even after the monasteries were closed under Henry VIII early in the 16th century, the consecrated grounds continued to serve as a legal refuge until well into the 18th century.⁺¹⁰

+ In the late 17th century Daniel DeFoe was one who fled to the sanctuary known as Whitefriars to avoid his creditors and as a result gained inspiration for the novel, Moll Flanders.

Criminal quarters also evolved around older London hospitals which served the poor,¹¹ much in the manner that it is argued modern drug clinics attract addict offenders. The public steam baths in areas such as Southwark provided a warm and concealed environment for the practice of prostitution, (thus the term stews as a synonym for prostitutes) and in the process attracted other criminals as vice areas have traditionally done.¹² The London docks with their nearby sailors bars and rooming houses were also a natural area for prostitution and low dives. In the 19th century the blocks near railroad stations were similarly attractive because they contained the lodgings of traveling men.¹³

A second factor which created high crime districts (even though they were not "criminal districts") was their direct attractiveness as crime targets. For example the central business district of London where merchants, aristocrats, and the middle class, with well filled purses, tended to be found. This area was infested with so called footpads, known in modern parlance as muggers or purse snatchers i.e. robbers who used strong arm methods against the victims. Another crime attractor was the public highways then few in number. Since the poor seldom journeyed far, the main roads leading into London were utilized by the better off who were targets of armed robbers known appropriately as "highwaymen." A third area was the London docks whose miles of moored ships, piers, and warehouses contained a great deal of easily transportable merchandise. Over the centuries the waterfront was the scene of repeated nighttime raids by marauding bands.

But here the relationship between crime and the physical attractor was complicated by the fact that the waterfront, as noted, was a vice area and by its nature was also an undesirable residential location. Those who lived nearby were usually low income persons who worked in the area. Given their proximity to and familiarity with the area many dockside residents specialized in marine theft.

In 19th century America a similar phenomenon could be noted in relation to docks and later railroad yards. For example the youthful residents of neighborhoods such as the West Side of Manhattan, adjacent to the New York Central railroad yards, developed considerable skill at looting boxcars and warehouses. ⁺¹⁴

A third major design factor in the creation of criminal districts was a result of various official and unofficial building regulations and practices. As early as the reign of Elizabeth I in England (1558-1603) the authorities feared that the growth of London would present insoluble problems to the maintenance of public order (and health). As a result, in 1593 a proclamation was issued providing that no new buildings should be erected within three miles of the gates

⁺ In the 20th century the same conditions prevailed in neighborhoods where truck terminals were concentrated. For example a small area approximately three miles Southwest of the Chicago Loop was long famous as the principal residence of the city's cargo thieves.

of the cities of London or Westminster⁺ and that no dwelling house in either city should be converted into more than one family occupancy, that there should be no inmates or lodgers within the prescribed limits, and that no commons within three miles of London should be enclosed.¹⁶

In Paris the authorities took a similar view. As de la Mare wrote:

It was to be feared that the city of Paris having arrived at this successive size, might share the fate of the most powerful cities of the Ancient World which had found within themselves the seed of their ruin, for it was very difficult for order and police to be suitably distributed among all parts of such a great whole.¹⁷

Thus at the outset of the modern era the hypothesis that size, density, and housing of population were directly related to crime and disorder was widely accepted.

The various prohibitions on the growth of London accomplished little to halt the trend but did exert a powerful influence on the nature of that growth with resulting significant effect on

⁺ London is a term with different meanings. Historically it referred to the old city within the walls. By the 18th century, it also included the City of Westminster and urbanized areas of the counties of Middlesex and Surrey. In the 19th century, it meant the Metropolitan Police district established in 1829, and enlarged in 1840 to about 700 square miles. Later, in the 19th century, a portion of the metropolitan area was included within a newly created County of London. The population of greater London is estimated as follows:

1600-200,000	1750-676,000
1650-400,000	1801-900,000
1700-575,000	1820-1,275,000

In 1700, one-third to one-fourth of the population resided in the Old City of London, while by 1800, only about one sixth did.¹⁵

crime and disorder. Given the increase in population new housing was a necessity but since illegal construction always faced the possibility of being raised by official order it had to be cheap so that its destruction would not occasion significant economic loss to its owners. Since its future was uncertain it was also necessary to obtain the greatest use, thus it was not uncommon for a single room to be rented to several families. It was also common to construct additions to existing buildings so as to avoid the ban on new construction. Another practice was to attempt to hide, or at least make less obvious, new construction by placing it in within already existing courtways and alleys. By the 18th century London was filled with numerous warren-like, cheap, overcrowded housing. Not surprisingly the areas most likely to receive the cheap illegal housing were those populated by the poor, particularly those already recognized as criminal districts.¹⁸ Thus the building regulations of the times expanded slums which in turn produced crime.

Even the physical configuration of the London slums exacerbated the problem. To Henry Fielding, novelist and magistrate, the vast growth of London with its labyrinth of lanes, alleys, courts, and cellars appeared as "a vast wood or forest, in which a thief may harbor with as great security as wild beasts do in the deserts of Africa and Arabia."¹⁹ That is they facilitated crime.

Buildings

The central feature of the London slum districts was the rookeries, high, narrow, crowded buildings, named derisively for the birds nests.²⁰ For example, the Callmel Buildings, a no thoroughfare court in Marylebone Parish close to Portman Square, was a self contained Irish colony with three to four families living in each room from cellar to garret amidst, "such a scene of filth and wretchedness as cannot be conceived."²¹

While the Callmel buildings were surrounded by a respectable section of London, St. Giles constituted an entire district of rookeries. As one writer described it in the 1830's:

The nucleus of crime in St. Giles consists of about six streets, riddled with courts, alleys, passages, and dark entries, all leading to rooms at smaller tenements....There is, moreover, an open communication at the backs of all the houses, so that directly a panic is created, men, women, and boys may be seen scrambling in all directions to the backyards and over the party walls to effect an escape²²

The area was described as an almost endless intricacy of courts and yards crossing each other, which gave to the place the appearance of a rabbit-warren.²³

The enclosed courtways of the Callmel or St. Giles buildings not only limited possible outside surveillance but also made it dangerous for officers to enter lest they be trapped in the enclosed space and set upon. Thus the rookeries became off limits to the authorities unless they were prepared to muster a large force to overcome opposition; something they would not do save in the instance of a serious crime such as the hunt for a murderer. A watchman (policeman) called to a disturbance in the Callmel building declared, "If I go in, I know I shall have a shower of

brickbats," to which a fellow officer counseled, "Let them murder each other if they please."²⁴ A similar situation existed in Paris in the cour des miracles, a historic criminal district "where depredators and desperados gathered unchecked and defied authority."²⁵ Clearly such areas produced, attracted and facilitated crime.

New York presented many similarities to London where tenement buildings became the equivalent to the rookeries. Given the configuration of Manhattan Island (which for practical purposes constituted all of New York City in the 19th century) growth could only move in an upward direction. As commerce and population expanded they had to be lodged in taller buildings, providing an intensive cost effective use of valuable land. Those who could afford the time and expense of a carriage ride to work preferred to live in the nicer neighborhoods beyond the commercial districts. However, these too were frequently overrun by the expansion of commerce and tenements. Thus there was a continuing instability of neighborhood life as new immigrants poured in on the old and the old upon the more established middle class. As early as 1857 it was well recognized and a committee of the state legislature noted:

As our wharves became crowded with warehouses, and encompassed with bustle and noise, the wealthier citizens... transferred their residences to streets beyond the din; -compensating for remoteness from their counting houses, by the advantages of increased quiet and luxury. Their habitations then passed into the hands...of industrious poor, whose employment in workshops, stores, and about the wharves and thoroughfares, rendered a near residence of much importance....(but)the rapid march of improvements speedily enhanced the value of property in the lower wards of the city, and as this took place, rents rose, and accommodations decreased in the same proportion...those who were able to do so, followed the example

of former proprietors, and emigrated to the upper wards. The spacious dwelling houses then fell before improvements or languished...as tenant houses of the type which is now the prevailing evil of our city...They soon became filled from cellar to garret, with a class of tenantry living from hand to mouth, loose in morals, improvident in habits, degraded or squalid as beggary itself.²⁶

One notable tenement building, the Old Brewery (named for its former use), was located in the Five Points slum district of lower Manhattan.⁺ The neighborhood was described in 1842 by Charles Dickens:

This is the place: These narrow ways, diverging to the right and left, and reeking everywhere with dirt and filth. Such lives as are led here, bear the same fruits here as elsewhere. The coarse and bloated faces at the doors, have counterparts at home, and all the wide world over. Debauchery has made the very houses prematurely old.²⁷

The configuration of the Old Brewery resembled the London rookeries with overcrowded rooms, many in dark cellars, and numerous underground passages. At its height it contained about 1,000 families half of whom were Irish and the rest freed Blacks. Over a period of 20 years it reputedly witnessed a murder a night although this could hardly have been true. However, when it was demolished in the 1850's workmen removed bags of bones from bodies that had apparently been hidden within the building.²⁸

As the tenements of New York City grew, their environs took on many of the same characteristics as the warrens of London.

⁺ The Five Points district included the area bounded by Broadway, Canal, Bowery, and Park Row. The actual Five Points was the intersection of Cross, Anthony, Little Water, Orange and Mulberry Streets.

Social reformer, Jacob Riis noted that the construction of apartments over no thoroughfare courts and blind alleys kept out surveillance from whole blocks.²⁹

Streets

While buildings received most attention as producers or attractors of crime, the role of streets did not pass unnoticed. Roadways were not only places where crimes occurred, providing opportunity for the prosperous wayfarer to be attacked, but even in medieval times they were recognized as routes or facilitators for criminals to move about, and as places where potential offenders could congregate. One major source of crime and disorder in London from late medieval times, was the apprentice boys, some 10,000 of whom resided in London when the population was less than half a million. It was common for groups of apprentices to wander through the streets at night seeking diversion by brawling and roistering much in the manner of present day youth gangs.³⁰

Streets also presented the same problems as the housing warrens since medieval streets were winding and twisting with a number of openings into side alleys or courtways which permitted offenders to look about and to easily evade the authorities.³¹ Even in New York it is notable that the most crime ridden slum was located in the Five Points where, as the name implied, five streets intersected. In addition to their (unintended) function as facilitators, attractors or even producers of crime, streets also provided the possibility of repressing crime by providing means whereby passers-by could observe various neighborhoods. However, the fact that many streets wound and twisted or were dead ends detracted from this function.

Land Use Patterns

In Europe cities grew over centuries and many of the basic patterns of land use were set well before the 19th century. American cities developed in comparatively brief periods from village to metropolis, often in the lifetime of a single individual. New York for example grew from 500,000 to 4 million population between 1850 and 1900, Chicago from 30,000 to 1,500,000 in the same period. Decisions conscious and unconscious often dictated form and design of the physical environment which in turn impacted on social behavior including crime. Turn of the century Chicago, for example, was a city where extensive rail nets criss crossed the city, and stockyards and open hearths belched forth distinctive odors. It was in effect a giant factory. Thus some have sought a link between Chicago's physical environment and its high rates of violence.[†] General Nelson Miles, a Civil War hero and Indian fighter, who commanded federal troops in Chicago in 1894 commented that the city had "more men engaged in cruel occupations and living in scenes of blood and slaughter than any other."³³ Frederick Thrasher, a University of Chicago sociologist, attempted a more systematic explanation. He argued that crime and delinquency in certain neighborhoods was related to the extent to which industrial development intruded

[†] Incidents such as the railroad strikes of 1877 and 94, the Haymarket bombing of 1886, and the race riot of 1919, as well as others claimed many lives. This background caused Sociologist, Allan Grimshaw to declare:

"In only one northern city is evidence available which indicates that social violence of greater or lesser intensity, is an almost continuous phenomenon. This is Chicago."³²

into residential enclaves. According to Thrasher crime was highest in the so-called "interstitial areas" located between the encroaching industrialism and the more solid residential areas. ³⁴

Even less open crimes could be traced to patterns of urban land use, growth, and location. For example, the relationship between crime, disorder, and urban design does not usually take account of vice conditions save in reference to the location of bordellos and bars in slums or adjacent to the waterfront and railroad stations. However, there is evidence that the establishment of vice districts in relation to particular urban patterns might dictate public reaction and indirectly exercise a significant impact upon political developments in a city. In New York from the 1860's onward the city's leading vice district was located astride the main thoroughfare, Broadway from 14th to 42nd street, eventually migrating northward to the 40's and 50's as the Manhattan population itself moved upward. Thus it was always at the physical heart of the city, highly visible to visitors and residents alike. Therefore, it was almost impossible for upper-class New Yorkers to ignore the city's vice district since they would have to pass through it en route to work and other activities. On four occasions between 1894 and 1933 reform elements managed to overturn the dominant Democratic political machine largely on anti-vice issues.

Philadelphia was very similar to New York in age and growth in population and it too had a vice district but it was located between the downtown section and South Philadelphia, the latter

a low income ethnic area situated on a peninsula. Therefore, as Samuel B. Warner, Jr. has pointed out it was not common for upper income citizens to enter the area.³⁵ While the city had its anti-vice crusaders the dominant Republican party was never defeated between 1884 and 1951. It is possible that the location of New York's vice area which made it very prominent, as opposed to the secluded location of Philadelphia's, is at least a partial explanation of the differing political histories.

Summary

In sum, policies and practices regarding the design and form of various cities have contributed to crime in at least six ways:

1. The nature of various physical facilities may have served as indirect attractors which caused the formation of criminal districts.
2. Certain areas such as business districts or docks served as direct attractors of crime.
3. The concentration of poor quality housing in criminal districts exacerbated existing conditions and produced more crime.
4. Poorly constructed, overcrowded, dingy buildings and/or bleak surroundings may have created negative attitudes on the part of residents which in turn produced criminal behavior.
5. The maze or warren-like patterns of buildings and streets may have facilitated criminal acts by concealing visibility and affording easy escape for criminals.
6. Both factors 4 and 5 combined to discourage police authorities from acting vigorously. The fact that individuals resided in St. Giles, Cour Des Miracles, or Five Points stigmatized them as being unworthy of police assistance, and to officers the physical maze made it more difficult for them to observe, or apprehend offenders, and dangerous or futile to undertake pursuit.

PREVENTION AND CONTROL

Direct Controls

As various observers were aware of the potential of urban design to attract, produce or facilitate crime, it was natural that attempts would be made to counter these effects. As noted earlier the authorities sought to limit the size of London from the 16th century onward. Their efforts not only failed but contributed significantly to the creation of slums which in turn made the problems of crime difficult to control.

British governments from the 16th to the 19th century commonly dealt with crime and other social problems by passing prohibitive laws rather than taking more positive steps; their delay in creating a police system until 1829 being but one example. Thus initiative was largely in the hands of private enterprise. To the fear of crime prevalent in 18th century London there was available two direct environmental control solutions-- fortification and flight. An urban resident of means could provide strong locks, bars, and other defenses for his home. 18th century London townhouses were separated from the sidewalk by an open area about six feet wide and six feet deep. This area was enclosed by iron railings and bridged by steps leading to the front door. Basement windows were fitted with iron grills, and front doors were heavily constructed and fitted with massive locks.³⁶ In addition the householder and his servants kept arms handy. Individuals could also avoid venturing abroad especially at night and then they might choose to ride in a bullet proof coach with armed guards.³⁷

Another alternative available to better off citizens was to

remove their residences to areas some distance from the slums. From the earliest days of the growth of metropolitan London a tendency toward spatial segregation by class was apparent. The basic pattern of growth was outward from the old city walls with the wealthier citizens generally moving to the West and the poorer the East and South, although until the 18th century it was common for the wealthy to live alongside the poor.⁺ As a newspaper of 1748 noted:

If we look into the streets, what a medly of neighborhood do we see! Here lives a personage of high distinction; next door a butcher with his stinking shambles! A tallow-chandler shall front my ladies nice venitian windows; and two or three brawny naked curriers in their pits face a fine lady in her back closet and disturb her spiritual thoughts.³⁹

There is some evidence that the relative social integration of London exacerbated the fear of crime. The reality of 18th century crime is difficult to gauge and a full explanation of the various factors present would require more space than available. However, the most careful analyses suggest that property crime and street disorder were high, but major violence minimal. Indeed foreign observers, who noted the prevalence of theft also commented on the low frequency

⁺ In Continental cities it was normal for different classes to reside in the same houses, with the poor living in the basement or lower floors, the wealthy above them, and the middle classes at the top. Even in the 18th century Paris though, some districts were noted as slums and others as middle or upper class.³⁸

of murder.^{+ 40} Yet the fear of crime on the part of upper and middle classes was high. One explanation offered was the extensive consumption of gin in the 18th century.. Starting about 1725, gin was introduced into England and rapidly became a staple of the lower classes. Where they had previously drunk low potency beer, gin provided a cheap and powerful substitute and the behavior of the poor became more disorderly. 18th century London was frequently the scene of major and minor riots and disturbances by mobs of drunken looters who might set fires. For example in the so called Gordon Riots of 1780 a mob estimated at some 60,000 destroyed Catholic chapels, and the houses of government officials, attacked public buildings including the bank of England and set fire to several prisons releasing the inmates.⁴²

Thus the relative class integration of 18th century London meant lower class street disorder was highly visible to the better off citizens and increased their fears of crime; a term which generally embraced all forms of disorder. Throughout the 18th and 19th century there was a growing tendency for the well off to move to the West End, where their homes were surrounded by the great open spaces of Hyde Park and Regents Park; the West End providing distance and barriers from the congestion, crime, and disease of the slums.⁴³

⁺ In an age when the death penalty was provided for upwards of 200 offenses and frequently employed, the following statistics shed some light on the situation. Of 678 executions between 1749 and 1771, only 87 were for murder. While in 1785, of 97 executions, 43 were for burglary, 31 for robbery, and only one for murder.⁴¹

More general environmental control measures were directed at the security of the streets or particular districts. For generations it had been the practice to stretch chains across certain streets at night in order to prevent the apprentices or other rowdies from entering.⁴⁴ After the fire of 1666 this practice fell into disuse to be replaced by the first organized street lighting.

The streets were also routes through which mobs moved during times of civil disorder. The narrow streets of Paris were easily barricaded by political rebels who could then hold off sizeable military forces. In the 1850's under Napoleon III and his Prefect, Baron Haussmann, Paris was extensively rebuilt. Part of this effort involved the creation of broad boulevards whose width and location made it difficult to barricade and in turn facilitated the movement of security forces. It was also common to establish army barracks at key locations throughout the city.⁺

The creation of new street patterns was also used to provide barriers between upper income districts and slum areas in the same manner as the public parks. As early as 1814 Regent Street in London was deliberately designed for this purpose.⁴⁵ The mid century reconstruction of Paris saw many slums bounded by boulevards in order to create barriers between them and the better districts.⁴⁶

⁺ While it is less well recognized the same practice was employed in American cities most notable Chicago, which from the mid 19th century onward witnessed more civil disorder than any other city. In the late 19th century national guard armories were constructed (on the fortress model) to command the main streets entering the central business district of the city.

Certain areas which were attractive targets to criminals could be secured providing two factors were present. First, the area had to be well defined physically, and secondly, it could not have a significant residential population of criminals. Highways, riverfronts, and the central business districts usually met these requirements. No robber or thief actually lived on a road or pier as opposed to its environs. The CBD, on the other hand, varied sometimes containing only commercial establishments other times residential facilities. If the basic conditions were met, an intensive surveillance would suffice to provide security. For example the London roads were relatively safe on Sunday when large numbers of people journeyed to the outlying areas for recreation.⁴⁷ Where natural surveillance did not exist an improvised one could be created in the form of police patrol. Though London did not see the creation of a regular police force until 1829, starting in the middle of the 18th century, special police were formed to protect the CBD, the highways, and the harbor. Henry Fielding's successors as magistrates at the Bow Street Court, formed a foot patrol for central London (1782) to which was added a mounted patrol for the highways. (1805) These forces were supplemented by a detective group known as The Bow Street Runners. In 1798 another magistrate, Patrick Colquhoun, formed a marine police to protect the riverfront. In Paris the financial district was deliberately drawn into a small area to provide for its protection by a police force.⁴⁹

Perhaps the most popular design solution to the problem of crime (and disease) was to engage in a direct attack on the slums.

In London, Paris, and New York, a common approach to the problems presented by the rookeries, tenement buildings and their equivalents was to raise such structures. In 17th century Paris, Louis XIV's police chief de la Reynie leveled a portion of the Cour Des Miracles and the surrounding district, a task brought to completion by his 18th century successors.⁵⁰ In the 19th century Baron Haussmann undertook a more complete restoration of the city tearing down whole sections. In describing the contrast between the new Paris and the old, Haussmann wrote:

"Then I skirted the palais de justice with, on my left, the shameful mass of old cabaret that used to dishonor the Cite and which I later had the pleasure of raising to the ground--hideouts of thieves and assassins who seemed to defy justice and the police."⁵¹

In New York the Old Brewery was torn down before the Civil War and in the 1890's the Five Points district underwent considerable urban renewal after a generation of urging by Jacob Riis.⁵²

In 19th century **England** the government was much more tentative although when opportunities presented themselves they were frequently availed. In London the needs of industrial expansion necessitated new streets many of which were deliberately cut through the rookeries as means of reducing them in size. Although in some instances this had the effect of increasing the size of some other remaining rookeries.⁵³

Positive Controls

In the old world the authorities seldom sought to directly ameliorate the condition of the poor. Although Napoleon III declared, "when building flourishes everything flourishes." In

essence his philosophy was than an extensive building program was itself a positive influence in the sense that a Ceasar raises popular morale by creating various physical manifestations of the glory of his reign. It also provided a good deal of work for the populace. In the 1860's some 20% of the Paris work force was employed in construction.⁵⁴

In New York Jacob Riis based much of his plea for slum clearance on the premise that better housing would encourage people to be better citizens. Whether this in fact resulted is not clear since as the Five Points thinned out new slums developed. Thus positive controls received little attention as compared with more direct measures and its impact was usually diffused.

Summary

The urban design solutions to crime have a long history.

Among the more common have been:

- 1) The imposition of limits on size and density
- 2) Target hardening measures such as fortifying buildings and barricading streets.
- 3) Segregation of classes by geographic distance or the use of parks and streets as barriers.
- 4) Attempts to increase security by concentrating particular targets and increasing surviellance by troops, police, or the public.
- 5) Direct reconstruction of supposed criminal districts by destroying them, decreasing their size or making them more visible.

POLICY IMPLICATIONS

The foregoing material suggests a number of hypotheses regarding the influence of the physical environment on crime. At the most general level it appears to be well documented that official and unofficial policies and practices regarding construction or land use can significantly influence the level, patterns, and distribution of predatory crime. Such influences may be the results (anticipated or unanticipated) of deliberate policies or the unintended consequences of efforts which take no cognizance of crime problems. In general the relationship between crime and urban design in the cities studied reflects mostly unanticipated results.

In the first instance the attempts of English governments to limit the growth of London failed in the face of the enormous increase in population which the social and economical developments of the modern period produced. In fact, not only failed but made conditions of life, health, and safety worse than if they had never been promulgated. It seems clear that the effect of concentrating low quality housing amidst the worst criminal districts increased the problem of crime in these areas. In the light of events an alternative policy for the growth of London might well have included realistic limits on the number of occupants and units per acre and provisions for dispersal of low income populations. One might also note that various urban renewal efforts, whether in London, Paris, or New York generally had the effect of simply moving slum districts rather than erradicating them.

At the more specific level of design it would also appear well documented that the maze pattern of housing or street design and the use of visibility limiting devices such as closed courtways, and dead end streets provided a crime conducive environment by hampering visibility and permitting easy escape. One might also accept the hypothesis that the location of various facilities, even of a neutral type, can serve to attract criminals.

All of the foregoing are generally recognized in contemporary times although usually not acted upon. For example, Meyerson and Banfield have reported how, in the 1950's the city of Chicago located massive low income housing projects in the midst of high crime areas rather than scattering them about the city.⁵⁵ Rubenstein has pointed out how police look down upon the residents of housing projects and fear to enter their enclosed spaces.⁵⁶ Neighborhood groups continue to oppose the location within their area of even such mundane facilities as hamburger stands, on the grounds that they cause criminals to congregate.

Less certain of generalization are various other hypotheses; indeed some are in conflict. Thrasher's notion that the incursion of industrial facilities into residential areas promotes social disorganization and criminal behavior, is in part offset by Jane Jacobs plea for diversity; although the latter was largely arguing for commercial and residential integration. Based upon the experience of dockside neighborhoods it would appear that the concentration of heavy industry has a deleterious affect upon nearby community life.

A more difficult task is to reconcile the observation that class integration may increase fear of crime, with the finding that concentrations of low income persons in slum areas increases actual crime, since the former is usually as destructive to society as the latter. After the 19th century reconstruction of Paris some argued that social tensions had been increased by the greater segregation of the classes. Yet Pinkney has concluded this was largely a myth.⁵⁷ It is unlikely that real class integration can be achieved in societies where individuals have free choice, but policies which stimulate middle class flight while concentrating low income populations in problem areas are unhealthy for a metropolis. As the example of London and Paris illustrates, different classes can live in the city, if not side by side, at least a few blocks apart; a situation different from the current American urban pattern of massive inner city slums and remote suburbs.

As regards more direct security measures here too the evidence is mixed. Doubtless the instillation of security devices benefits individual dwellings or business establishments. It is also likely that the enhancement of surveillance in particular areas by establishing police patrols, accelerating the flow of traffic, or concentrating business establishments is useful.⁺ Much less certain is the utility of establishing formal boundaries between neighborhoods by the deliberate placement of streets and other barriers. As noted it is a means whereby different classes can live in proximity. However, no real assessment of such prac-

⁺ This conclusion rests in part on the notion that the amount of crime is not a constant i.e. blocked in one's sphere it will reappear in another. For a discussion of displacement see, Thomas Reppetto, "Crime Control and the Displacement Phenomenon" Crime and Delinquency, April, 1976.

tices appears in the literature. Similarly there is little evidence regarding the use of positive incentives such as improved housing for the poor, though one can reasonably accept that the conditions of the rookeries and tenements previously described could only produce negative influences.

In sum it appears clear that various elements of the built environment may serve as attractors, producers, or facilitators of crime and that the physical environment can be manipulated to enhance security. The problem for researchers is to identify specifically the degree to which particular processes and techniques of urban design are beneficial in particular environments.

FOOTNOTES

1. Jane Jacobs, The Death and Life of Great American Cities (New York, Random House, 1961)
2. Oscar Newman, Defensible Space (New York, Macmillan, 1973) p. 57
3. See for example: L. Rainwater, "The lessons of Pruitt-Igoe," The Public Interest Summer 1967, pp. 116-26; S. Angel Discouraging Crime Through City Planning, (Berkeley, California, University of California, 1968); G. Luedtke and Associates, Crime in the Physical City (Detroit, 1972); H.A. Scarr Et. Al., Patterns of Burglary 2nd. Ed. (Washington D.C. United States Government Printing Office, 1973) H.L. Malt Tactical Analysis of Street Crime (Washington, D.C. Malt Associates, 1973); S. Wilcox The Prevention and Control of Robbery. Vol. III, "The Geography of Robbery," F. Feeny and A. Weir Eds., (Davis California, University of California, 1974); T.A. Reppetto, Residential Crime (Cambridge, Massachusetts, Ballinger, 1974)
4. National Commission on the Causes and Prevention of Violence, "Urban Violence and the Design and Worm of the Urban Environment," in Crimes of Violence, Vol. 12 (Washington, D.C., United States Government Printing Office, 1969) p. 699
5. Ibid. p. 714
6. National Commission on the Causes and Prevention of Violence. Final Report: To Establish Justice, To Insure Domestic Tranquility (Washington, D.C. United States Government Printing Office, 1969) p. 46
7. Op. Cit. National Commission, Crimes of Violence pp. 697-98
8. Ibid. p. 699
9. Terence Morris, The Criminal Area (London: Routledge and Keegan Paul, 1951) p. 20
10. Sidney and Beatrice Webb, The Development of English Local Government (London: Oxford University Press, 1963) p. 84
11. J.J. Tobias, Crime and Industrial Society in the 19th Century, (London: B.T. Batsford, 1967) p. 131
12. Luke O. Pike, A History of Crime in England, 2 Vols. (Montclair, New Jersey: Patterson-Smith, 1968, Original 1873-76) Vol. I, pp. 235-36.
13. Charles Booth, On The City: Physical Pattern and Social Structure ed. Harold Pfautz (Chicago: University of Chicago Press, 1967)
14. Herbert Asbury, The Gangs of New York (New York: Alfred A. Knopf, 1927) p. 345

15. On London Population See Op. Cit. Tobias p. 35 and,
George Rude, Hanoverian London 1714-1808
(Berkeley California, University of California Press, 1971)
16. 35 Eliz., C.6 Cited in Op. Cit. Pike, Vol. II p. 80
17. Quoted in P.J. Stead, The Police of Paris
(London: Staples Press, 1957) p. 21
18. M. Dorothy George, London Life in the 18th Century
(New York: Capricorn Books, 1965) pp. 69-73
19. Henry Fielding, An Enquiry into the Causes of the Late Increase
in Robbers (London, 1751, Reprinted AMS Press, 1975) p. 76
20. Thomas Beames, The Rookeries of London
2nd. Edition (London: Frank Cass and Company, 1852) p. 2
21. Op. Cit. George., p. 115
22. See Op. Cit. Tobias, p. 131
23. Henry Mayhew, London Labour and the London Poor
Volume IV (London, Frank Cass, 1967, Orig. 1861-62) p. 299
24. Op. Cit. George p. 117
25. Major Arthur Griffiths, Mysteries of Police and Crime (London:
Cassell and Company, 1904) Vol. I p. 194
26. "Report of the Select Committee appointed to examine into the
condition of tenant houses in New York and Brooklyn,"
transmitted to the Legislature March 9, 1857 (Albany, New
York), pp. 11-12. Quoted in Glaab, The American City: A
Documentary History, (Homewood, Ill., The Dorsey Press, 1963)
p. 269
27. Charles Dickens, American Notes
(London: Oxford University Press, 1957, Orig. 1842) pp. 88-89
28. Op. Cit. Asbury, pp. 13-19
29. Jacob Riis, The Battle with the Slum
(Montclair, New Jersey: Patterson-Smith, 1969, Orig. 1902)
pp. 27-28
30. Op. Cit. Pike Vol. II p. 240-41
31. H.J. Dyos, "Urban Transformation: A Note on the Objects of
Street Improvement in Regency and Early Victorian London,"
International Review of Social History, Vol. II, 1957 p. 264
32. Allan A. Grimshaw, Racial Violence in the United States
(Chicago: Aldine Publishing Company, 1969) p. 285
33. Quoted in Gerald G. Eggert Richard Olney: Evolution of a
Statesman (University Park Pennsylvania: Penn State Press, 1974)
p. 143

34. Frederick M. Thrasher, The Gang
(Chicago: University of Chicago Press, 1927) pp. 20-22
35. Samuel B. Warner, Jr. The Private City: Philadelphia in
Three Periods of its Growth
(Philadelphia: University of Pennsylvania Press, 1965) p. 183
36. Op. Cit. National Commission, Crimes of Violence p. 700
37. Patrick Pringle, Hue and Cry
(London: William Morrow, 1965) p. 56 and Charles Reith,
The Blind Eye of History (Montclair, New Jersey: Patterson-
Smith, 1975) p. 134
38. David H. Pinkney, Napoleon III and the Rebuilding of Paris
(Princeton, New Jersey: Princeton University Press, 1958) p. 8
39. Op. Cit. Rude p. 86
40. Sir Leon Radzinowicz, A History of the English Criminal Law
and its Administration from 1750 4 Volumes
(London: Stevens and Sons, 1948-68) Volume I pp. 708-09
41. Ibid. p. 148
42. Op. Cit. Rude, pp. 222-24
43. Op. Cit. Booth, p. 90
44. Op. Cit. Pike, p. 241
45. Op. Cit. Dyos p. 261
46. Op. Cit. Pinkney, p. 36
47. Op. Cit. George, p. 97
48. See Patrick Culquohon, A Treatise on the Commerce and Police
of the River Thames (Montclair, New Jersey Patterson-Smith
1968, Orig. 1800)
49. Op. Cit. National Commission, Crimes of Violence p. 703
50. Op. Cit. Stead, pp. 26-27
51. J.M. and Brian Chapman, The Life and Times of Baron Haussmann
(London: Wiedenfeld and Nicolson, 1957) p. 2
52. Op. Cit. Riis
53. Op. Cit. Dyos, pp. 262-64
54. Op. Cit. Pinkney p. 37
55. Martin Meyerson and Edward C. Banfield, Politics Planning and
the Public Interest (New York: The Free Press, 1955)

- 56. Jonathan Rubinstein, City Police
(New York: Farrar, Straus and Giroux, 1973) p. 278
- 57. Op. Cit. Pinkney, pp. 9-10

BIBLIOGRAPHY

- Asbury, Herbert The Gangs of New York
(New York: Alfred A. Knopf, 1927)
- Beames, Thomas The Rookeries of London
2nd Edition, London: Frank Cass and Company Ltd., 1852
- Booth, Charles On the City: Physical Pattern and Social Structure
ed. Harold Pfautz, Chicago: University of Chicago Press, 1967
- Chapman, J.M. and Brian The Life and Times of Baron Haussmann,
London: Wiedenfeld and Nicolson, 1957
- Colquhoun, Patrick A Treatise on the Commerce and Police of the
River Thames Montclair, New Jersey Patterson-Smith, 1968, Orig. 1800
- Dickens, Charles American Notes
London: Oxford University Press, 1957, Orig. 1842
- Dyos, H.J. "Urban Transformation: A Note on the Objects of
Street Improvement in Regency and Early Victorian London,"
International Review of Social History, Vol. II, 1957, pp. 259-65
- Fielding, Henry An Enquiry into the Causes of the Late Increase
in Robbers. London, 1751, Reprinted by AMS Press, 1975
- Griffiths, Major Arthur, Mysteries of Police and Crime
London: Cassell and Company, 1904
- George, M. Dorothy London Life in the 18th Century
New York: Capricorn Books, 1965
- Mayhew, Henry London Labour and the London Poor
Volume IV London: Frank Cass, 1967, Orig. 1861-62
- Meyerson, Martin and Edward C. Banfield Politics Planning and
the Public Interest New York: The Free Press, 1955
- Morris, Terrence The Criminal Area
London: B.T. Batsford Ltd., 1967
- National Commission on the Causes and Prevention of Violence
"Urban Violence and the Design and Form of the Urban Environment"
in Crimes of Violence Volume 12
Washington, D.C.: United States Government Printing Office, 1969
- Pike, Luke O. A History of Crime in England
2 Volumes Montclair, New Jersey: Patterson-Smith, 1968
(Reprinted from 1873-76 Ed.)
- Pinkney, David H. Napoleon III and The Rebuilding of Paris
Princeton, New Jersey Princeton University Press, 1958

Pringle, Patrick Hue and Cry
London: William Morrow, 1965

Radzinowicz, Sir Leon A History of The English Criminal Law
and its Administration from 1750 4 Volumes
London: Stevens and Sons, 1948-68

Reps, John W. The Making of Urban America: A History of
City Planning in the United States
Princeton, New Jersey Princeton University Press, 1965

Reith, Charles The Blind Eye of History
Montclair, New Jersey: Patterson-Smith, 1969

Riis, Jacob The Battle with the Slum
Montclair, New Jersey: Patterson-Smith, 1969

Rudé, George Hanoverian London, 1714-1808
Berkeley, California, University of California Press, 1971

Stead, Philip J. The Police of Paris
London: Staples Press, 1957

Thrasher, Federic M. The Gang
Chicago: University of Chicago Press, 1927

Tobias, J.J. Crime and Industrial Society in the 19th Century
London: B.T. Batsford Ltd., 1967

Warner, Sam Bass, Jr. The Private City: Philadelphia in
Three Periods of its Growth
Philadelphia: University of Philadelphia Press, 1968

Webb, Sidney and Beatrice The Development of English Local
Government
London: Oxford University Press, 1963



NEW

3/17

REVISED DRAFT: DO NOT QUOTE

PRIVATE AND PUBLIC - MINDED
CITIZEN RESPONSES TO A NEIGHBORHOOD - BASED
CRIME PREVENTION STRATEGY

Anne L. Schneider and Peter R. Schneider

Revised, February 1978

INSTITUTE OF POLICY ANALYSIS
777 High Street, # 222
Eugene, Oregon 97401
(503) 485-2282



ABSTRACT

Appropriate citizen responses are essential to the effectiveness of any environmental approach to crime prevention. It is generally believed that residential crime can be reduced through an increase in the "natural" surveillance of a neighborhood by persons who live there; by an increase in the degree to which residents of an area assist each other in crime prevention; and (with more debate) through an increase in the use of mechanical prevention devices such as locks, alarms, and so on. The questions examined in this chapter are:

1. Whether participants in a neighborhood-based, educational crime prevention program differ from non-participants in the degree of protective neighboring, by-stander helpfulness, and use of target-hardening security devices of various types;

2. Whether this approach is more (or less) effective for certain types of households than for others; and

3. Whether other characteristics of the household (such as income, type of neighborhood, etc.) are associated with the extent of protective neighboring, by-stander helpfulness, and use of target hardening security devices.

The study is based on data from Portland, Oregon, collected for an evaluation of the Portland neighborhood-based crime prevention program. This program is designed to increase both the extent of neighborhood surveillance by residents of the area and to increase the use of private, target-hardening devices. At small group meetings, held in the home of someone on the block, the crime prevention bureau representative provides information and encouragement to residents of the block on how to better protect their area and their homes. One of the key purposes of the meetings is to help the residents of the area become better acquainted with one another.

The major conclusions from the study are:

1. The small group (block) meeting approach used in Portland appears to be effective in bringing about the types of citizen response that are considered essential linkages between environmental programs and crime prevention. Persons who attended these meetings were more likely than others to engage in protective neighboring, by-stander helpfulness, and private target-hardening efforts.

2. This type of program appears to have a greater impact on collective prevention (helping with neighborhood surveillance and other aspects of "protective neighboring") than on private target hardening such as purchase of weapons, installation of new locks, use of alarms, and so on.

3. Attendance at block meetings is the only variable in this analysis that has any substantial relationship to by-stander helpfulness. The impact of meeting attendance operates almost entirely through its effect on low income persons and persons who live in less well-kept neighborhoods of the city.

4. Attendance at the block meetings appears to have a more pronounced impact on the protective neighboring responses of apartment renters than of homeowners and on the persons who have lived for a longer period of time in the neighborhood.

5. Most of the citizen responses examined in this study are associated with income, length of time the individual has lived at the address, and other types of social, economic, or demographic variables that are not subject to simple manipulation through publicly-sponsored crime prevention programs. Nevertheless, these relationships do not totally determine the nature of citizen response and the only programmatic variable in this analysis (attendance at block meetings) had, in most instances, a stronger impact on citizen response than did the socio-economic variables. Thus, the results suggest that citizen response to the environment is amenable to change through small-group educational efforts.

INTRODUCTION

Environmental approaches to crime prevention, broadly defined, include any type of program that impacts on the design or use of a physical or geographical area of a city.¹ Included in this definition are the physical design of residential areas, public housing projects, downtown malls, and so on. Also included as part of the broad definition of environmental crime prevention approaches are programs directed at a particular geographic area of a city with the intent of changing the way that the citizens use the area, the way they protect it, and the way that they interact with each other within the area.

It is generally believed that residential crime can be reduced through an increase in the "natural" surveillance of a neighborhood by persons who live there; by an increase in the degree to which residents of an area assist each other in crime prevention; and (with more debate) through an increase in the use of mechanical prevention devices such as locks, alarms, and so on. A critical question for persons interested in designing programs to reduce residential crime is how (or whether) residents of an area can be motivated to increase the level of crime-preventive actions and behaviors within their neighborhood. It is clearly the case that target-hardening campaigns by city officials will not reduce burglaries if individuals do not respond by improving the security of their residences. It is just as clear that designing public housing to increase the residents' sense of territoriality and social cohesion will not reduce crime unless the residents' behavior reflects an increased sense of proprietorship, protectiveness, and so on. Although appropriate citizen response is a critical theoretical link between environmental design and crime reduction, there is little scientific knowledge about how

INTRODUCTION

Environmental approaches to crime prevention, broadly defined, include any type of program that impacts on the design or use of a physical or geographical area of a city.¹ Included in this definition are the physical design of residential areas, public housing projects, downtown malls, and so on. Also included as part of the broad definition of environmental crime prevention approaches are programs directed at a particular geographic area of a city with the intent of changing the way that the citizens use the area, the way they protect it, and the way that they interact with each other within the area.

It is generally believed that residential crime can be reduced through an increase in the "natural" surveillance of a neighborhood by persons who live there; by an increase in the degree to which residents of an area assist each other in crime prevention; and (with more debate) through an increase in the use of mechanical prevention devices such as locks, alarms, and so on. A critical question for persons interested in designing programs to reduce residential crime is how (or whether) residents of an area can be motivated to increase the level of crime-preventive actions and behaviors within their neighborhood. It is clearly the case that target-hardening campaigns by city officials will not reduce burglaries if individuals do not respond by improving the security of their residences. It is just as clear that designing public housing to increase the residents' sense of territoriality and social cohesion will not reduce crime unless the residents' behavior reflects an increased sense of proprietorship, protectiveness, and so on. Although appropriate citizen response is a critical theoretical link between environmental design and crime reduction, there is little scientific knowledge about how

prevention benefits of small-group educational meetings.

ENVIRONMENTAL APPROACHES FOR BURGLARY PREVENTION

Environmental approaches to prevent burglaries or other residential crimes can be divided into those designed to reduce the likelihood of victimization for the individual household ("private" prevention) and those designed to reduce the probability of victimization for the immediate neighborhood where the individual lives ("collective" prevention). By definition, target-hardening approaches result in private crime prevention since these increase the security of the individual household through the use of locks, alarms, and so on. Other approaches can be geared toward increasing the social cohesion of the neighborhood, the degree of protective neighboring, the extent of by-stander helpfulness, and other types of "public-minded" crime prevention.

Collective Protection

There have been several excellent research studies concerning the incentives and conditions that prompt individuals to help protect others from crime.² Latane and Darley propose that there are five critical decisions by-standers must make before they will respond in an appropriate way to a crime situation:

1. Noticing that a crime situation exists,
2. Interpretation of the situation as an offense;
3. Acceptance of a personal responsibility to act in an appropriate way,
4. Choice of the type of response (direct or indirect),
5. Method of response

The issues of major interest to those who wish to design environmental

approaches for public-minded burglary prevention concern the elements needed to induce an appropriate response at each of the five decision points identified by Latane and Darley. Two elements that are especially subject to manipulation by environmental crime prevention have considerable promise for increasing public-spirited types of burglary prevention efforts.

The first of these is whether the by-standers (or neighbors) are acquainted with one another. Persons who know one another should be more inclined toward protective neighboring and by-stander helpfulness for many reasons. Several of these will be reviewed below.

1. Latane and Darley's studies showed that when there were more by-standers to an emergency or crime situation, the probability that any one of them would act in an appropriate way was reduced. Their work showed, in most instances, that a victim was less likely to be helped by a group of by-standers than by a single observer to the event. The impact of size on helpfulness, however, disappeared when the by-standers knew one another, even though they did not know the victim. These results, based on laboratory and field experiments, suggest that neighbors in urban areas will not be inclined to assist one another if they are not acquainted with each other. Responsibility for taking appropriate action seemingly diffuses when there are many persons, all strangers to each other, who might act, and diffuses in such a way that no one is helpful to the victim. The results were reversed when the by-standers were friends.

2. Latane and Darley's work also indicates that by-standers who know the victim are more likely to act than those who do not know the victim. The negative effect of the number of by-standers on helpful acts was removed when the observers of the incident were acquainted with the victim. The length of time that the by-stander had been acquainted with the victim was

not related to the speed of the appropriate response, but whether this would hold true in other settings is not known.

3. It is reasonable to presume that neighbors who know one another are more likely to notice a crime situation, and more likely to interpret it as an offense. Recognition that someone in the area is a stranger requires that one has at least a minimal recognition of persons who live in the area. Recognition that persons carrying goods out of a neighbors home is a crime situation requires some knowledge of who the neighbors are and whether they are moving, going on vacation, buying new furniture, and so on.

If it is the case that persons who know one another act in a more protective way toward each other, then crime prevention efforts to encourage social cohesion and "neighboring" could be effective in reducing crimes. Physical design of areas is one approach and educational efforts designed to bring the residents of an area together to increase social cohesion and "neighboring" could have similar effects.

A second variable that may be easy to manipulate and effective in increasing public types of prevention is to provide cues and information to individuals concerning what they should watch for and what they should do if they observe certain types of behavior in the neighborhood. Bickman's research on shoplifting showed that subjects in the experiment greatly increased the rate at which they reported shoplifting when the experimenter off-handedly mentioned that if they observed any of this type of behavior to inform the store manager.

There are several other elements that may be critically important as linkages between the environment and the behavior of by-standers or neighbors. Urbanization, and with it the crowded conditions of city life, is often considered to be a fundamental causative factor in the rising crime rates that have been observed throughout most of this century.³ Population density could impact on crime both through its effects on offenders and on the law-abiding citizens. It

has been proposed that crowded conditions result in a depersonalization of the interaction among citizens which is accompanied by persons being treated as objects rather than as human beings.⁴ This could influence crime by increasing the likelihood that offenses will be committed and/or by decreasing the probability that individuals will assist one another in crime prevention. Stimulus overload, a presumed effect of crowding, could decrease the probability that individuals will notice crime events and, even if they notice them, will interpret the situation as one to which they should respond.

As has been noted by several authors, it is the perception of crowding rather than population density per se that potentially is important in understanding human behavior.⁵ Whether the physical design of an area can reduce the perception of crowdedness even though the population density is high, is not known. Even less is known about whether other types of environmental approaches--especially neighborhood-based educational ones--can reduce the perception of crowding by assisting persons in getting acquainted with one another.

Private Prevention: Target-Hardening Approach

Target-hardening approaches for reducing residential property crime have encountered two major problems: charges that the efforts simply displace crime rather than reduce it, and low participation by the citizens.⁶

Displacement is a critical issue for the target-hardening approach primarily (or only) if public funds are being used to encourage or subsidize private protection. If tax dollars are spent to encourage or provide an increased amount of private security to some residents of a city and if these efforts result only in a displacement of the crimes to non-participants in the program, then one can argue on a cost-benefit basis that such expenditures should not be made. If the result of the expenditure

is no change in the total amount (or cost) of crime (only a redistribution) then the cost clearly exceeds the benefits of the program. The problem is compounded even further if participants in the target-hardening program tend to come disproportionately from the higher income groups since this could, theoretically, redistribute the burden of crime from higher income groups to the less well-off segments who are less able to absorb the costs of crime. If the result of target-hardening is to reduce crime not only for participants but for the entire collectivity, then the use of public funds for such programs is not as arguable. Thus, when designing burglary prevention programs it is critically important to know how much of the crime is displaced and how much is prevented.

There are certain types of burglaries which are not at all likely to be displaced to other households. Included in this category are the following:

(a) Burglaries committed against a specific victim due to a prior disagreement or dispute between the offender and the victim are not likely to be displaced since the offender has not selected a random victim and presumably would be uninterested in burglarizing anyone except the targeted household.

(b) Burglaries committed by the "opportunistic" offenders probably are not displaced. An opportunistic offender, by definition, is one who commits the crime only because the opportunity presented itself.

(c) Burglars who commit as many offenses as their time and resources permit and who are deterred by private security mechanisms will not be able to make up for lost time and, therefore, would lose some of their opportunities to commit offenses.

Arguments have been made in some studies that burglars are not particularly mobile and, therefore, burglaries are not likely to be displaced to other neighborhoods.⁷ This argument may be correct for area-wide prevention programs, but it is fallacious when one is considering private, mechanical-

type, security measures for a particular household. Burglars who encounter a well-fortified house on a block do not need to shift neighborhoods; they can shift to the house next door. Thus, unless an area has 100 percent participation in the private security programs, the mobility argument cannot be used to minimize the potential displacement impact of target-hardening approaches.

Previous research on displacement has focussed almost exclusively on area-wide displacement effects (from one block to another; one neighborhood to another). This research is not relevant for the problem presented by household-level target hardening approaches because areas rarely, if ever, achieve 100 percent participation.

In a study conducted by Wilson and Schneider, households that had participated in an anti-burglary sticker program were matched with non-participating households located one block away from the participating one.⁸ The data did not show that localized displacement had occurred, but more studies of localized displacement are needed before any definitive conclusions can be drawn. As noted above, localized displacement would have a particularly troublesome side effect if it is the case that higher income households are more likely to engage in private, target-hardening activities. The combination of income discrepancies between participants and non-participants along with displacement could result in target-hardening approaches redistributing crime from those who are better off to those who are less able to absorb the costs of crime.⁹

Another procedure that might be used to estimate the potential displacement effect of private target-hardening would be to calculate the proportion of burglaries that fit into the three categories named above. Unfortunately, there is no information available concerning how many burglaries

involve persons who know each other, how many are committed by opportunistic offenders, nor how many commit offenses at every available opportunity and therefore "lose" opportunities when they are deterred. Thus, the state of knowledge concerning the displacement impact of private security at the household level is close to zero.

Presuming that private protective activities are an appropriate response by the citizens (and that issue is far from being settled), the problem of how to encourage their participation in such programs is a critical one.¹⁰ A major problem with the widely-used property marking and anti-burglary sticker display programs has been a lack of participation by citizens. Heller's synthesis of existing research on these programs indicates that the level of participation in most jurisdictions was so low that the overall burglary rate would not have been reduced much even if participants had reduced their victimization rates to zero.¹¹ The failure of citizens to participate could be based on a lack of knowledge about the program, a lack of belief in its effectiveness, or the costs (time or monetary) of obtaining the engraving equipment and the anti-burglary stickers.¹²

Although most property marking, sticker programs have not been able to demonstrate an area-wide impact on burglary rates, almost all of the existing studies have shown that households which participate have lower burglary rates than those which do not.¹³ Thus, the key issue in this type of target-hardening approach is not so much whether it works for participants, but whether the crimes are displaced and how one encourages use of the stickers. As noted by Tien, "the ultimate value of mechanical crime prevention programs appears critically dependent on their capacity to avoid large scale displacement effects...."¹⁴

The remainder of this chapter deals with an empirical assessment of how citizens responded to a particular type of neighborhood-based burglary preven-

tion program in Portland, Oregon, and the characteristics of households that are associated with the different types of responses. The research issues to be examined are:

1. Whether or not participants in the small-group, neighborhood-based approach to crime prevention are more likely to engage in protective neighboring, by-stander helpfulness, and private target-hardening efforts than are non-participants;

2. To explore the general characteristics of households that are associated with greater or lesser amounts of protective neighboring, by-stander helpfulness, and private target-hardening efforts.

DATA AND METHODOLOGY

The Portland Program

The Portland program is a particularly interesting one to study because its objectives were to increase neighborhood cohesion in an attempt to improve the "natural" surveillance of the area by its residents as well as to increase private security usage by the residents. Households in various areas of the city that would be willing to host meetings of other families living on the same block were identified through door-to-door canvassing and a few other procedures.¹⁵ A representative from the City Crime Prevention Bureau (CPB) would speak at these meetings and encourage residents to undertake both private and neighborhood prevention activities.

The private prevention techniques that were recommended included the usual information about different types of locks, alarms, use of outside lighting around entrances to the residence, and removal or trimming of hedges to increase the visibility of the residence. In addition, persons were encouraged to engrave their property with a property marker distributed at the meeting and stickers were issued by the Crime Prevention Bureau office after the property was engraved. The stickers notified

would-be burglars that property had been marked. The neighborhood prevention efforts included information on the methods of operation that burglars tend to use, information on what types of behavior by strangers in the area should be considered "suspicious," information on what to do if one observed suspicious behavior or a crime in progress, and exhortations for the residents in the area to help watch out for the safety of each other.

A conscious objective of the program was to bring persons together in small groups in order that they might get acquainted with each other, become a more cohesive neighborhood, and through the increased sense of cohesion, assist in the reduction of burglaries for their area of the city.

The Data

The data used in this study are from a victimization survey conducted by the Office of Justice Programs in Portland, with assistance from the Institute of Policy Analysis in Eugene, Oregon.¹⁶ Data were collected from a random sample of city residents and from randomly selected persons who had attended one of the block meetings. In all, 1,216 personal interviews were completed--a response rate of 61 percent of the original sample.

Measurement and Variables

Five dependent variables are used in the study.

1. Protective Neighboring. Protective neighboring is defined as the extent to which respondents, in the interview situation, say that persons in the neighborhood assist in protecting each others' property. The variable is an additive index composed of responses to four questions (see Table 1).

2. By-Stander Helpfulness. By-stander helpfulness is defined as the number of appropriate actions the respondent actually took as a fraction of the total number of opportunities which the respondent reported to the

TABLE 1. PROTECTIVE NEIGHBORING¹

ACTUAL QUESTION	RESPONSES AND SCORING SYSTEM
(a) Do you think the people who live near here would help watch out for your property when you are not home?	Yes =1 point for scale Maybe =0 No =0 Don't Know=0
(b) During the last year have you asked a neighbor to watch your home while you were gone?	Yes =1 No =0 Don't Know=0 Never leave home=missing data
(c) During the last year has a neighbor asked you to watch their home while they were gone?	Yes =1 No =0 Don't Know=0
(d) If you were being attacked or robbed, do you think your neighbors would come to your assistance, or call the police... or ignore the incident...or what would they do? (Interviewers were to record <u>all</u> responses given in answer to the question).	Come to assist = 1 Call the police= 1 Ignore it =-1 Other = 0

Maximum score = 5.

¹An index was created from the questions shown by adding scores across the various questions. A person who gave the appropriate response to every question would have a score of five. An individual who said that no one asked them to watch their home; they had not asked anyone; neighbors would not watch out for their property; and, if they were attacked, the neighbors would ignore it, would have a score of -1. (There were 14 people with scores of -1.)

interviewer. Table 2 shows the situations which were used to define "opportunities" and the responses that were considered to be appropriate ones.

3. Private Actions. An index of private security actions was created from responses to five questions indicating whether the household had a gun or other weapon that was intended for use in crime prevention; whether the household had an alarm or other type of similar device for automatically notifying the police or neighbors in the event someone broke into their home; whether the persons' property was protected by theft insurance; whether there were outside lights (not including decorative lighting), and whether the household had a dog who could serve as a guard or watch dog in case a stranger entered the home. It should be noted that this scale indicates the total number of private actions, regardless of when the household took the action.

4. Anti-burglary Stickers. The fourth dependent variable is whether the household had displayed anti-burglary stickers recommended by the Crime Prevention Bureau.

5. Recent Private Actions. The index of recent private actions is similar to the private action index except that the former includes only the actions taken (or devices purchased) during the year immediately preceding the interview. The index of private actions is a total summary measure, regardless of when the household first began using the devices. The index of recent action includes the following: Adding new or better locks; adding locks or other preventive hardware to windows; adding an alarm; adding outside (non-decorative) lighting; cutting shrubs or hedges to increase visibility at entrances; purchase of a weapon to be used for prevention; purchase of an automatic timer for lights or radio; and purchase of theft insurance (other than auto).

The major independent variable is whether the household had been represented at one of the neighborhood-based block meetings sponsored by the

TABLE 2. BY-STANDER HELPFULNESS INDEX

QUESTION:	RESPONSE	SCORING		
		Opportunity	Helpfulness	
<hr/>				
(a) During the past year has a neighbor asked you to watch their home while they were gone?				
If yes, was a burglary or other crime committed while you watched their home?	YES NO	1 0	↙ ↘	
If yes, was this crime reported to the police?	YES NO			1 0
<hr/>				
(b) During the past 12 months have you seen a crime or an attempted crime such as the ones I have just asked you about as it was being committed or even shortly afterward?	YES NO DON'T KNOW	5 0 0	↙ ↘	
If yes, did you get involved in this incident in any way, such as trying to stop it, talking to the police, being a witness in court, or anything else like that?	YES NO			} 1 0 1 1 1
If yes, in what way did you get involved?	INTERVENED. REPORTED TO POLICE. TALKED TO POLICE/WITNESSED. INFORMED THE VICTIM.			
<hr/>				
(c) If a similar incident were to occur again, in what way would you get involved next time, if any?	WOULD NOT GET INVOLVED. ANY TYPE OF INVOLVEMENT.		0 1 ↔ 1	
<hr/>				
(d) Have you seen or heard anything during the past 12 months which made you think that someone was intending to commit a crime or that someone might be committing a crime?	YES NO, DON'T KNOW	2 0	↙ ↘	
If yes, did you do anything?	CALLED POLICE OR OTHER APPROPRIATE PERSON. INTERVENED OR INVESTIGATED.			} 1
<hr/>				



Crime Prevention Bureau. Other characteristics of individuals that we expect to be correlated with the use of public or private prevention are included in the analysis both in order to control their effects when assessing the importance of attendance at the meeting and in order to describe the characteristics of individuals who are more (or less) inclined toward protective neighboring, by-stander helpfulness, and each type of private protection. These characteristics, and the expected relationship with the dependent variables, are described below.

1. Length of Time in the Neighborhood. It is expected that persons who have lived at their current address for a longer period of time will know other persons on the block better and, therefore, will be more likely to engage in protective neighboring and (possibly) by-stander helpfulness. The equivocation concerning the relationship between time at the address and by-stander helpfulness is due to the fact that we do not know whether the opportunities to be helpful occurred in the neighborhood, at work, on vacation, or in some other context. Thus, by-stander helpfulness is not a measure of neighboring, per se, but is a more general measure of helpfulness regardless of the context in which the opportunity arose. It is not expected that the length of time in the neighborhood will be related to the use of private security devices.

2. Income. Persons with higher incomes are expected to engage in more types of private security protection since they are better able to afford these and because they presumably have more to lose from burglaries. It is not expected that income will be related as strongly to protective neighboring because this type of protection is "free." But, because higher income persons stand to lose more if burglarized, a weak positive relationship is expected with protective neighboring. No relationship is anticipated between

income and by-stander helpfulness because the latter is a pure helpfulness measure and involves no monetary gain nor loss for the individual by-stander.

3. Rent vs. Owning of Property. Ownership is expected to be related positively to protective neighboring and to the use of private security mechanisms. We expect ownership to be related to protective neighboring because persons who own their property should feel a greater sense of proprietorship and territoriality about it. Furthermore, it is more difficult for renters to engage in protective neighboring since it is more difficult for most of them (e.g., those in apartments) to see the residences of their neighbors. The variable representing home ownership is scored in the following way: a score of four represents the owner of a single family residence; three is the score for persons who rent a single family home; two is the score given to persons who are duplex renters; and a score of one is given to persons who rent an apartment.

4. Prior victimization status. Persons who had been burglary victims would be expected to have higher scores on protective neighboring and private security usage, other things being equal, due to their increased sensitivity to the need for protection from crime and due to the expectation that they would be more likely to recognize a crime situation. We anticipate that persons who have been the victims of personal crimes should have higher scores on by-stander helpfulness because they would be more likely to recognize a crime situation and have more sensitivity to the plight of the victim. These expectations cannot be tested using the existing data because we do not know whether the persons who were victims had been victimized before or after they engaged in protective neighboring, by-stander helpfulness, and so on. Nevertheless, these variables will be statistically controlled when examining the effect of the other independent variables

in order to prevent the victimization status from confounding other relationships in the data.

5. Household Density. We do not have a measure of neighborhood crowdedness and, in lieu of one, have used the household density as a surrogate for the more general measure of crowdedness. This variable was created by dividing the number of rooms in the house by the number of people living there, including children. We expect that crowdedness will be negatively related to protective neighboring and to by-stander helpfulness because of the presumed depersonalization that occurs in crowded living conditions. It is reasonable to expect that persons in crowded conditions would rely more on private than on public protection (other factors, especially income, being equal).

6. Age of Respondent. We have no particular expectations about the relationship between age and any of the dependent variables, but have included it for exploratory purposes and as a control variable in case there is a significant relationship with one or more of the dependent variables of interest that could confound the interpretation given to other relationships in the data.

7. Physical Upkeep of the Block. The interviewers coded onto the questionnaire their assessment of the general upkeep of the area that could be seen from the respondent's front entrance (clean, some trash, very trashy). Although this is a judgmental assessment, we expect that the general upkeep of the area would be a reflection of the sense of proprietorship or territoriality felt by the residents and, if so, we would expect better-kept areas to have higher scores on protective neighboring.

Interaction Effects

An analysis of several interaction variables will be undertaken to determine whether the relationship between block meetings and neighborhood or private protection depends on certain conditions or characteristics of the households, such as household income. This analysis is limited to an examination of the interaction between attendance at meetings and each of the other independent variables. If attendance at the meetings interacts with income, for example, this would mean that attendance at meetings has a different type of impact on the criterion (dependent) variable for persons at different income levels. The direction of the relationship can be ascertained in order to determine whether the meetings have more impact on low income persons, for example, than on high income persons.

Methodology: Statistics

Multiple regression analysis is used to determine the magnitude of the relationships between independent and dependent variables. The procedure that was used involved entering the key independent variable first in the equation (attendance at block meetings) and then entering the control variables in order to determine the impact of meeting attendance when the other characteristics of the household have been held constant. One of the problems with this type of field research is that it is difficult to determine the temporal causation of an independent and dependent variable. For example, it could be argued that persons who are more inclined toward protective neighboring are more likely to attend block meetings. Thus, any observed relationship between meeting attendance and protective neighboring cannot be attributed unequivocally to meeting attendance. Multiple regression analysis is a technique designed to at least partially overcome this problem in that other characteristics of the household which might

prompt attendance at the meeting and be related with protective neighboring are statistically controlled in an effort to estimate the effect of attending a meeting which is independent of other household characteristics.

For this particular study, the problem is reduced somewhat not only with the statistical procedures, but also by the process through which the program identified households to host block meetings and by the way the sample was drawn. Most of the persons who attended block meetings were identified through door-to-door canvassing of their area or by personal contact from program or block personnel. Most of the non-attenders in our sample (98 percent) lived in areas where no block meetings had been held at all because the program had not targeted these areas for participation in the program.

The interaction analysis is conducted by entering the interaction variable into the multiple regression equation when all of the other variables are controlled.¹⁷

RESULTS

The results of the multivariate analysis are summarized in Table 3 and a full display of the results for each dependent variable is presented in Appendix A, Tables 6 through 10.

In Table 3, the dependent variables are shown across the top and the independent variables are listed in the rows on the left. There are two entries relating each independent variable to each dependent variable. The first shows the direction of relationship that was expected between the independent and dependent variables, using the plus sign for a positive relationship and a minus for a negative relationship. Variables for which no expected relationship was stated as part of the theory have no plus or minus signs in the "expected" column. The second entry is the standardized

TABLE 3. RESULTS OF MULTIPLE REGRESSION ANALYSIS¹

	Protective Neighboring		By-Stander Helpfulness		Private Actions		Use of Stickers		Recent Private Actions	
	Exp.	Found	Exp.	Found	Exp.	Found	Exp.	Found	Exp.	Found
Attendance at CPB Meeting	+	+.21 ^{***}	+	+.22 ^{***}	+	+.06 ^{***}	+	+.28 ^{***}	+	+.14 ^{***}
Length of Time At Address	+	+.06 ^{**}		-.08		-.06 [*]		+.03		+.003
Income	+	+.13 ^{***}		+.06	+	+.24 ^{***}	+	+.04	+	+.11 ^{***}
Homeowner Status	+	+.15 ^{***}		.00	+	+.19 ^{***}	+	+.04	+	+.06 ^{**}
Victimization										
Burglary		-.04 ^{**}		+.11 ^{**}		-.01		+.002		+.14 ^{***}
Personal/Violent		-.03		+.09		-.01		-.03		+.03
Personal/Theft		-.03		+.06		+.03		+.05 [*]		+.08 ^{**}
Crowdedness	-	+.01	-	-.04		-.04		-.01		+.12 ^{***}
Age		-.02		+.10		-.05		+.10 ^{***}		-.05
Upkeep of Area	+	+.09 ^{***}		-.06		-.07 ^{***}		+.01		+.07 ^{***}

¹ Entries in the cells of the table show the expected relationship (+ for positive; - for negative) and the regression coefficient (standardized) for each independent variable with each dependent variable when all the other variables listed in the rows of the table had been statistically controlled. If there is no + or - for the expected cell, this indicates that no theoretical prediction had been made about the direction of the relationship. One asterisk indicates statistical significance at the .05 level, two indicates significance at the .01 level, and 3 means the significance is at or beyond .001.



regression coefficient showing the observed relationship between each independent and dependent variable when the other independent variables were statistically controlled. For example, the plus sign between "attendance at CPB meeting" and "protective neighboring" means that we expected persons who had attended meetings would have higher scores on protective neighboring and the +.21 regression coefficient indicates that in the sample data analyzed for this report persons who attended meetings have higher scores on protective neighboring when length of time at address, income, homeowner status, and so on were statistically controlled.

All of the variables were scored in such a way that a positive relationship indicates higher scores on the dependent variable are associated with the presence of the independent variable and/or with higher scores on the independent variable. Thus, persons who attend block meetings have higher scores on protective neighboring, by-stander helpfulness, private actions, use of stickers, and recent private actions. A negative regression coefficient indicates that the presence of the independent variable (or "more" of it) is related to lower scores on the dependent variable. A thorough discussion of multiple regression analysis is beyond the scope of this paper, but the interested reader is referred to the discussion in footnote 18 and the references cited therein.

Block Meetings

The major finding is that attendance at a city-sponsored small group block meeting to discuss crime prevention is associated with significantly higher scores (at the .001 level or beyond) on protective neighboring, by-stander helpfulness, private actions, use of anti-burglary stickers, and recent improvements in residential target-hardening. The implication is that attendance at the Portland-style block meetings is associated with

the types of private and neighborhood protection usually considered essential to environmental crime prevention efforts. The relationship is statistically significant even after income, length of time at the address, homeowner status, crowdedness, upkeep of neighborhood, age, and prior victimizations have been statistically controlled.

The importance of the meetings also can be shown by the data in Table 4. If all the variables in the analysis were (theoretically) zero, the average score on protective neighboring would be 2.8 on the five-point scale indicating that the average person had engaged in slightly more than half of the possible types of protective neighboring which were measured in this study. For persons who attended a block meeting, the protective neighboring score would average 3.38 on the five-point scale even if all the other variables in the analysis remained (theoretically) zero.¹⁹ Attendance at a meeting, on the average, increased the protective neighboring score of the respondent by .58.

The data in Table 4 also show that a person who attended a meeting would be expected to have a by-stander helpfulness score of 17.9 percent compared to a score of 4.3 percent if they did not. Persons who attend the meetings, on the average, take advantage of 13.6 percent more of the opportunities to be helpful than do people who have not attended the meetings. (Individuals who reported that they had no opportunities to be helpful were eliminated from this analysis.)

The relationship with private actions is statistically significant but not as pronounced. Persons who attend a meeting have, on the average, a .13 higher score on the five-point action scale than those who do not attend. The number of recent target-hardening activities is related to meeting attendance in that those who attend have scores .31 higher, on the average, than those who do not when the other variables have been controlled.

Attendance at block meetings has a strong relationship with the use of anti-burglary stickers. Of the persons who attend the meetings, approximately 40 percent would be expected to use the stickers (if the other variables are controlled), whereas approximately 12 percent of the non-attenders would be expected to use them.

TABLE 4. MAGNITUDE OF CHANGE ATTRIBUTABLE TO BLOCK MEETINGS

	Mean	s	Intercept (alpha)	B	Range of Scores	No. of Cases
Protective Neighboring	3.8	1.4	2.8	.58	-1 to +5	956
By-Stander Helpfulness	29	29	4.35	13.6	0 to 100%	215
Private Protection	1.94	1.03	.76	.13	0 to 5	956
Use of Stickers	.51	.50	.12	.28	0 or 1	956
Recent Protections	.96	1.09	.40	.31	0 to 8	956

¹The intercept value and B represent the value of these coefficients when the other independent variables (except for block meetings) had been statistically controlled. B is the unstandardized partial regression coefficient. The mean and standard deviation were calculated on the original variables without any control for the independent variables. When B is positive, it means that attendance at block meetings is associated with higher scores on the dependent variable. Since attendance at meetings is scored as 1 and non-attendance as zero, B represents the amount of change in the dependent variable associated with meeting attendance when the other independent variables have been controlled. The number of cases for the by-stander helpfulness analysis is smaller because many people had no opportunities to be helpful and were not included in the analysis.

The results of the interaction between meeting attendance and each of the other independent variables are summarized in Table 5. Several observations can be made about the types of households for whom attendance at block meetings appears to be related to greater protective activity.

Attendance has a more marked impact on the protective neighboring scores of apartment renters than of homeowners and has a somewhat more pronounced effect on persons who have lived in their neighborhood longer, rather than shorter periods of time. The results tentatively suggest that attendance at block meetings may have a more pronounced impact on the protective neighboring scores of persons who are burglary victims or victims of personal crimes rather than non-victims.

There are two statistically significant interaction terms for bystander helpfulness: Income and upkeep of the neighborhood. The interpretation is that the bystander helpfulness scores of low income persons are influenced more by attendance at a block meeting than are the scores of higher income individuals. Likewise, the data suggest that bystander helpfulness scores of persons in less well-kept areas are influenced more by attendance than are the scores of persons in better-kept areas of the city. On the other hand, meeting attendance is related to recent protective actions more strongly for persons in the well-kept areas. Income interacts with meeting attendance in relation to the amount of recent target-hardening activities in that the effect of the meeting appears to be greater for lower income persons.

The fact that block meeting attendance appears to be more effective for certain types of households does not mean it is ineffective for other types. The last row of Table 5 shows the impact (beta weight) for meeting attendance when all the other variables, including the interaction

TABLE 5. SUMMARY OF INTERACTION ANALYSIS¹

	Protective Neighboring beta	By-Stander Helpfulness beta	Private Protection beta	Use of Stickers beta	Recent Protection beta
Interaction of Meeting Attendance With...					
...Homeowner Status	-.36 ^{***}	.00	-.14	.09	-.03
...Length of Time at Address	.10 ^{**}	-.09	.07	.05	-.01
...Income	-.08	-.37 ^{***}	-.02	.05	-.22 ^{***}
...Victimization					
Burglary	.07 [*]	.00	-.03	.05	.03
Personal/Violent	.07 ^{**}	.12	.07 ^{**}	.04	.04
Property/Personal	.06	.02	.03	.00	.05
...Upkeep of Neighborhood	-.10	-.30 [*]	.08	-.02	.16 ^{**}
...Crowdedness	.04	-.01	-.04	.00	.00
...Age	-.07	.23	-.16	.17 [*]	.10
Attendance at Meeting, beta, with all interaction terms controlled	.43 ^{***}	.03	.41 ^{***}	.63 ^{***}	.41 ^{***}

¹The results show the standardized regression coefficient of the interaction term when the main effects and the other interaction variables have been statistically controlled. One asterisk indicates significance beyond the .05 level; two indicates significance beyond the .01 level; and three indicates significance beyond the .001 level.

terms, have been statistically controlled. With all the independent variables and the interaction terms controlled, meeting attendance has a pronounced and statistically significant relationship with protective neighboring, private protection, use of stickers, and recent protective actions. The data suggest, however, that the association between meeting attendance and by-stander helpfulness is due entirely to its effect on low income persons and persons living in less well-kept neighborhoods. This result, if it can be replicated elsewhere, should be rather encouraging to those who propose that physical design of public housing for low income persons can increase social interaction and, thereby, increase the extent of collective surveillance and protection in the area.

Collective Protection

The data in Table 3 show the relationship between each of the other independent variables and the two measures of collective protection.

Attendance at block meetings is more strongly associated with the degree of protective neighboring than any other variable in this analysis (beta = .21 for the main effect model and .43 for the interaction model). We had expected that persons who had lived at their current address for a longer period of time would have higher scores on protective neighboring. Even though a statistically significant relationship was found, the strength of it (beta = .06) is quite small. The data are consistent with the expectations that the amount of protective neighboring would be greater among high income persons, homeowners, and persons in better-kept neighborhoods. However, the expected relationship between crowdedness and protective neighboring was not found, nor do the data support the idea that crowdedness would be related to lower scores on by-stander helpfulness.

The only variables in the analysis that have much explanatory power

for by-stander helpfulness are the interaction terms: Meeting attendance seems to be especially important in increasing the helpfulness scores of low income persons and persons in less well-kept neighborhoods.

Private Actions

The data support the idea that higher income persons will use more private protective devices than low income persons. This indicates that the cost of private security is an important ingredient in its provision and also indicates that the better-off persons may have a higher demand for security since they potentially have more to lose from burglaries. Also as expected, homeowners tend to use more security devices than do renters. It is interesting to note that when income and homeowner status are statistically controlled persons in better-kept areas use fewer private security devices than those in less well-kept neighborhoods. One could speculate that this is attributable to a greater probability of burglary in the latter type of neighborhoods.

Use of Stickers

The use of anti-burglary stickers is not related to the independent variables in the same way that the other private security variables are. In fact, attendance at meetings and age of the respondent are the only variables with statistically significant relationships to the use of stickers.

Recent Actions

Persons are more likely to have installed new protective devices in the previous year if they have higher incomes, are homeowners, live in more crowded conditions, live in better-kept neighborhoods, had been a recent victim of a property crime, and if they had attended a block meeting.

DISCUSSION

Publicly funded efforts to prevent residential crime with environmental programs cannot be effective unless residents within the environment respond to those programs with actions that have a direct or indirect impact on the target crimes. It is generally assumed that certain types of responses will reduce residential crime. First it is often believed that protective neighboring and by-stander helpfulness will reduce residential property crimes (and other types) because offenders are more apt to be thwarted by quick action of the residents, more likely to be caught, and more likely to recognize the increased risk associated with committing offenses in an area where people watch out for each other. In addition, the more clear-cut sense of anti-crime values in highly protective neighborhoods could reduce the number of offenses committed by residents of the area against others in the same neighborhoods.

Second, it is generally believed that private protective actions such as target hardening will reduce crimes for those who use more protective devices. But it is not known whether household-level target hardening results in localized displacements to other residents of the same area.

The physical design of an area can be directed either toward target hardening (fortress style) or toward increasing the social cohesion, sense of proprietorship, territoriality, and other factors that presumably will result in greater neighborliness and collective protection of the area. And, some types of physical designs might accomplish both objectives simultaneously.

Physical design for crime prevention in housing developments is a feasible alternative mainly for newly developing areas, but it is often impractical as an approach to crime prevention in established residential

neighborhoods.

The approach used in Portland (and possibly other areas) is especially interesting because of the conscious effort to increase neighborhood cohesion and protection through the use of small group meetings held at the block level, usually in the home of a resident. The city Crime Prevention Bureau representative focusses not only on various types of target-hardening devices that could be used, but also on informing individuals at the meeting of how they could provide better surveillance for everyone on the block and thereby reduce residential crime for the entire area.

It is important to study the results of the small group educational approach in order to ascertain its potential value in established residential areas and to determine whether it would be useful to implement this type of strategy along with programs that focus primarily on changes in the physical (built) environment. The major conclusions from this study are:

1. The small group (block) meeting approach used in Portland appears to be effective in bringing about the types of citizen responses that are considered essential linkages between environmental programs and crime prevention. Persons who attended these meetings were more likely than others to engage in protective neighboring, by-stander helpfulness, and private target-hardening efforts.
2. This type of program appears to have a greater impact on the collective prevention of the households (helping with neighborhood surveillance and other aspects of "protective neighboring") than on private target-hardening such as purchase of weapons, installation of new locks, use of alarms, and so on.
3. Attendance at block meetings is the only variable in this analysis that has any substantial relationship to by-stander helpfulness. The impact of meeting attendance operates almost entirely through its effect on

low income persons and persons who live in less well-kept neighborhoods of the city.

4. Attendance at the block meetings appears to have a more pronounced impact on the protective neighboring responses of apartment renters than on the protective neighboring responses of homeowners or those of persons who have lived for a longer period of time in the neighborhood.

5. Several characteristics of the households were examined in order to measure their effect on collective and private protection. The income level of the households was related to protective neighboring, private protection, and to the number of recent target-hardening activities. Income was not related to by-stander helpfulness nor to the use of anti-burglary stickers. The measure of household crowdedness used in the analysis was not related to the various types of protection in the manner we had anticipated. Crowdedness was unrelated to protective neighboring, by-stander helpfulness, and private protection. Although crowdedness showed a statistically significant relationship with the number of recent target-hardening activities undertaken by the household, this result is difficult to interpret.

6. Most of the citizen responses examined in this study are associated with income, length of time the individual has lived at the address, and other types of social, economic, or demographic variables that are not subject to simple manipulation through publicly sponsored crime prevention programs. Nevertheless, these relationships do not totally determine the nature of citizen response and the only programmatic variable in the analysis (attendance at block meetings) had, in most instances, a stronger impact on citizen response than did the socio-economic variables. Thus, the results suggest that citizen response to the environment is amenable to

change through small-group educational efforts and, potentially, other types of environmental approaches to crime prevention.

7. It is not possible in this study to determine why the block meetings have an effect on collective or private protection activities. The earlier research by Latane, Darley and others would suggest that the meetings increase the amount of information and cues concerning what residents can do to prevent crime, assist in helping the persons get acquainted with one another, and perhaps increase the types of social rewards and sanctions for appropriate actions that might be forthcoming from the small group context.



APPENDIX. MULTIVARIATE MODELS

TABLE 6. MULTIVARIATE MODEL OF PROTECTIVE NEIGHBORING

Dependent Variable: Protective Neighboring					
	Bivariate r	B	Beta Weight	S.E. of B	F Value
Attendance at CPB Meeting	.27	.58	.21***	.08	47
Length of Time at Address	.11	.006	.06*	.004	2.3
Income	.23	.035	.13***	.009	13.5
Victimization:					
Burglary	-.03	-.24	-.04*	.15	2.5
Personal/Viol.	-.02	-.16	-.03	.15	1.09
Personal/Prop.	.00	-.19	-.03	.15	1.6
Upkeep of Neighborhood	-.19	-.34	-.09***	.12	8.1
Crowdedness	.03	.000	.01	.000	.12
Age	.04	-.001	-.02	.003	.17
Homeowner Status	.27	.19	.15***	.04	17.23
Alpha = 2.85					
R = .39 R ² = .15 F = 17					

The bivariate r is the correlation coefficient when no other variables have been controlled; B is the unstandardized, partial, regression coefficient; alpha is the intercept value when the other variables have been controlled. These figures are based on controlling the other independent variables, not on controls after the interaction terms were entered in the equation.

TABLE 7. MULTIVARIATE MODEL OF BY-STANDER HELPFULNESS

Dependent Variable: By-Stander Helpfulness					
	Bivariate r	B	Beta Weight	S.E. of B	F Value
Attendance at CPB Meeting	.22	.14	.22**	4.3	10
Length of Time at Address	-.07	-.20	-.08	.23	.81
Income	.09	.38	.06	.48	.64
Victimization:					
Burglary	.08	11.65	.11*	7.46	2.4
Personal/Viol.	.04	7.82	.09	5.98	1.7
Personal/Prop.	.07	5.25	.06	6.21	.71
Upkeep of Neighborhood	.02	5.32	.06	5.67	.88
Crowdedness	-.06	-.01	-.04	.01	.43
Age	-.03	.16	.00	.15	1.11
Homeowner Status	.05	.25	.00	2.25	.01
Alpha = 4.35					
R = .28 R ² = .08 F = 1.78					

The bivariate r is the correlation coefficient when no other variables have been controlled; B is the unstandardized, partial, regression coefficient; alpha is the intercept value when the other variables have been controlled. These figures are based on controlling the other independent variables, not on controls after the interaction terms were entered in the equation.

TABLE 8. MULTIVARIATE MODEL OF PRIVATE ACTIONS

Dependent Variable: Private Actions					
	Bivariate r	B	Beta Weight	S.E. of B	F Value
Attendance at CPB Meeting	.13	.135	.06***	.06	4.4
Length of Time at Address	-.07	-.004	-.06	.003	1.9
Income	.33	.05	.24***	.007	44.3
Victimization:					
Burglary	-.006	-.04	-.009	.12	.10
Personal/Viol.	.01	-.02	-.005	.11	1.13
Personal/Prop.					
Upkeep of Neighborhood	-.02	.21	.07***	.09	5.24
Crowdedness	-.10	.000	-.04	.000	1.8
Age	-.14	-.003	-.05	.002	1.66
Homeowner Status	.24	.18	.19***	.03	28.7
Alpha = .76					
R = .39 R ² = .15 F = 17					

The bivariate r is the correlation coefficient when no other variables have been controlled; B is the unstandardized, partial, regression coefficient; alpha is the intercept value when the other variables have been controlled. These figures are based on controlling the other independent variables, not on controls after the interaction terms were entered in the equation.

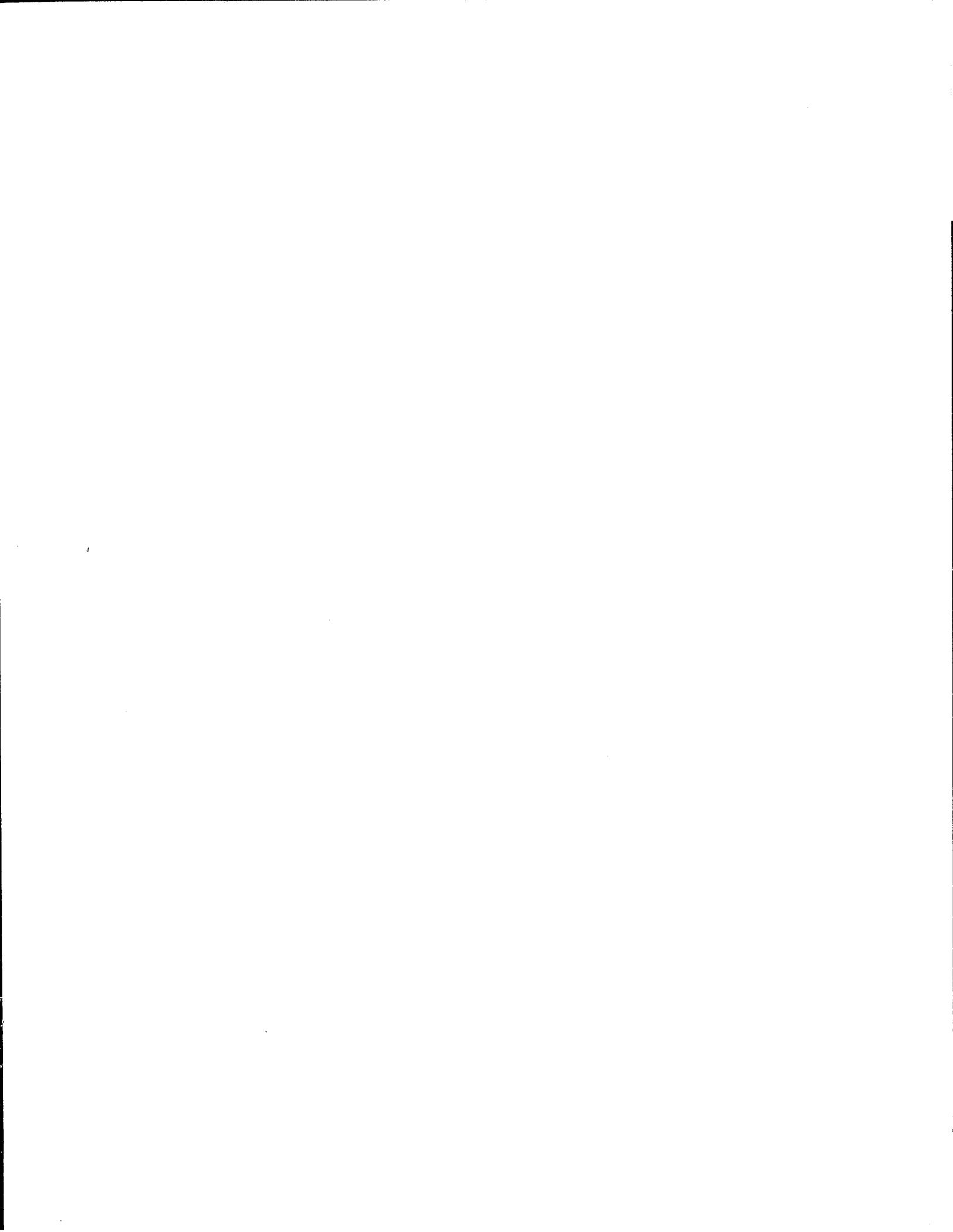
TABLE 9. MULTIVARIATE MODEL OF ANTI-BURGLARY STICKER USE

Dependent Variable: Anti-Burglary Sticker Use					
	Bivariate r	B	Beta Weight	S.E. of B	F Value
Attendance at CPB Meeting	.30	.28	.28***	.03	78.7
Length of Time at Address	.10	.001	.03	.001	.59
Income	.08	.004	.04	.003	1.4
Victimization:					
Burglary	.008	.005	.062	.057	.00
Personal/Viol.	-.04	-.06	-.03	.056	1.22
Personal/Prop.	.06	.08	.05*	.057	2.11
Upkeep of Neighborhood	-.08	-.02	-.01	.045	.14
Crowdedness	.04	.00	-.01	.000	.17
Age	.11	.003	.10***	.001	5.72
Homeowner Status	.14	.02	.04	.017	1.15
Alpha = .12					
R = .34 R ² = .11 F = 12					

The bivariate r is the correlation coefficient when no other variables have been controlled; B is the unstandardized, partial, regression coefficient; alpha is the intercept value when the other variables have been controlled. These figures are based on controlling the other independent variables, not on controls after the interaction terms were entered in the equation.

FOOTNOTES

1. The definitions used in this study of "environmental" approaches follow those provided by Tien, et al in Elements of CPTED (Crime Prevention Through Environmental Design), Westinghouse Electric Corporation, May, 1976. Although an "environmental" approach is often thought of as concerning only the physical (built) environment, the definition of environmental strategy used by Tien includes physical, social, management, and law enforcement programs that impact on the design or use of a physical or geographical area of a city.
2. Many of these are reported or summarized in Bibb Latane and John Darley, The Unresponsive Bystander, New York: Appleton-Century-Crofts, 1970. Also, see Leonard Bickman and Dennis P. Rosenbaum, "Crime Reporting as a Function of Bystander Encouragement, Surveillance, and Credibility," Journal of Personality and Psychology, Vol. 35, No. 8, 1977, pp. 577-585.
3. For an excellent review of the crowdedness literature, see Robert Sommer, Personal Space, Englewood Cliffs, N.J.: Prentice-Hall, 1969. Also, the July-August (1975) issue of the American Behavioral Scientist is devoted exclusively to the effect of crowding on behavior and contains several excellent articles about the relationship between crowding and/or density with crime.
4. See Sommer, Chapter 2; and Chalsa Loo, "The Psychological Study of Crowding," American Behavioral Scientist, July-August, 1975.
5. See Daniel Stokols, et al, "Physical, Social and Personal Determinants of the Perception of Crowding," Environment and Behavior, Vol. 5, 1973, pp. 87-115.



CONTINUED

5 OF 7

6. Tien, et al, has a summary of research relevant to the displacement question (p. 94 ff). Nelson Heller, et al, in "Operation Identification Projects: Assessment of Effectiveness," NILECJ, 1975, reviews three studies of displacement from property-marking programs which showed mixed and inconclusive results. Heller also discusses the low participation rate in Operation ID programs which probably are the most common type of fully-subsidized private prevention programs.

7. See Tien, pp. 97 ff.

8. The small sample size and small number of burglaries in the study made it difficult to draw definite conclusions but the preliminary results show that burglary rates of the participant and nearby non-participant households were very similar. These results will be reported in a forthcoming paper, L.A. Wilson II and Anne Schneider, "Investigating the Efficacy and Equity of Public Initiatives in the Provision of Private Safety," prepared for the Western Political Science Association meetings, Los Angeles, March 18-20, 1978.

9. The study by Wilson and Schneider shows that several types of private security actions, including the use of engravers and stickers, are unequally distributed among persons of different socio-economic status. However, the data also show that the inequality in use of anti-burglary stickers and engraving materials was not present among households who participated in program-sponsored block meetings.

10. It is generally assumed that, at worst, private protection would displace to others only those offenses that would have been committed against the highly fortified household. Charles Clotfelter, "Urban Crime and

Household Protective Measures," mimeo, 1976, suggests that the retreat into private protection could "interfere with the citizen's normal role as an informal guardian of his neighbors' property and personal safety. In this case, the use of protective measures would tend to increase the level of crime in society," p. 16. (A shortened version of this paper is forthcoming in the Review of Economics and Statistics.) The data used for the analysis in this chapter, however, show that there are positive and statistically significant correlations indicating that persons who use more private security devices have higher scores on protective neighboring ($r=.17$, $p=.001$) and persons who recently improved their private security also tend to have higher scores on protective neighboring ($r=.12$, $p=.001$).

11. See Heller (footnote 6).

12. An evaluation of the Portland program indicates that (according to statements made by survey respondents) lack of information about the program accounted for about 40 percent of the non-participation; lack of belief in its effectiveness accounted for approximately 18 percent of the non-participation; insufficient time to obtain the equipment was cited by 16 percent; and low burglary rates was named as the reason for non-participation by 16 percent. These results are reported in Anne L. Schneider, "An Evaluation of the Portland Neighborhood-Based Crime Prevention Program," Occasional Paper in Applied Policy Research, 1975.

13. The results from other studies show a significant reduction in burglary rates for participants of 25 percent in St. Louis; 33 percent in Seattle; 7 percent in Denver; 19 percent in Phoenix; 32 percent in Portland (1974); and 45 percent in Portland (1977). The first four results are reported in Heller. The Portland results are reported in Schneider, 1975, and in Whittemore, 1977.

14. Tien, et al, page 7.

15. Many of the block meeting hosts were identified by canvassing but some were prior burglary victims contacted by the program; others were persons suggested by prior hosts, and some were volunteers who contacted the agency. Most of the persons in the sample who had attended block meetings did so in 1974, 1975, and 1976.

16. A report on these procedures is contained in Whittemore's 1977 report. The interviews were conducted in late spring and early summer, 1977. Block meeting participants were intentionally oversampled (by drawing names from the program files of persons who had attended) in order to insure that a sufficient number would be interviewed. The sample of 1,216 contained 553 persons who had attended a Crime Prevention Bureau block meeting. As mentioned in note 14, most of the persons who attended did so at least one year prior to when the interviews took place, whereas most of the actions measured in the dependent variables took place within one year of the interview.

17. The interaction variables were created by multiplying the meeting attendance score (0 = non-attendance; 1 = attendance) by the other variable, such as income. The interpretation of the results for the interaction analysis depends on the direction of the relationship between the dependent and interaction variables when the other variables are also in the equation and, therefore, statistically controlled. Persons who did not attend a meeting have a score of zero on that variable and, therefore, have a score of zero on the interaction term. Persons who did attend will have a score on the interaction term equal to their scores on the variable with which the meeting variable was multiplied. For example,

suppose that Y is the predicted score on protective neighboring; X_1 is attendance at a meeting; X_2 is income, and X_1X_2 is the interaction term.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_1X_2$$

The expected score on protective neighboring for non-attenders at meetings is not changed by the interaction term since X_1X_2 is always zero for non-attenders. Scores on protective neighboring for persons who attended the meeting and who have higher incomes will be adjusted upward more than will the scores for low income persons if b_3 is positive and will be adjusted downward more than low income persons if b_3 is negative. Thus, a negative value on b_3 would indicate that attendance at a meeting has less impact on high income persons or, conversely, more impact on low income persons since scores of the former would be reduced more than scores of the latter.

18. The coefficients reported in Table 3 are standardized, partial, regression coefficients (beta weights). A beta weight represents the amount of (standardized) change in the dependent variable associated with one unit of standardized change in the independent variable. For example, the .21 beta weight between meeting attendance and protective neighboring in Table 3 means that a person who is one standard deviation above average in meeting attendance would be .21 standard deviations above average on protective neighboring, whereas a person one standard deviation above average on length of time at address would be only .06 standard deviations above average in protective neighboring. The coefficients in Table 3 can be compared across the different variables. The larger the coefficient (either positive or negative) the more change there is in the dependent variable as a result of standardized change in the independent variable. Values of B

In Table 4 cannot be compared across the different variables because B is the partial unstandardized coefficient. For example, a difference of one unit on the meeting variable (e.g., from zero meaning non-attendance to one indicating attendance) is associated with a difference of .58 on the protective neighboring variable. For a particularly insightful discussion, see Eric A. Manushek and John E. Jackson, Statistical Methods for Social Scientists, New York: Academic Press, 1977.

19. The value of 3.38 on protective neighboring for persons who attend a meeting is obtained by the formula $\hat{Y} = a + b_1 X_1$ where $a = 2.8$ (the intercept value), $b_1 = .58$ (B for protective neighboring and block meetings), and $X_1 = 1$ (persons who attended were given a score of one). If all the other variables are zero, then they add nothing to the score. The score for meeting attendees on by-stander helpfulness if all the other independent variables were zero would be $Y = 4.35 + 13.6(1) = 17.95$.

Developing Proprietary Attitudes Toward the Public Environment

Robert Sommer

The principles of defensible space were developed for residential buildings with 24-hour occupancy. They cannot be applied without modification to civic buildings and open spaces, such as parks, playgrounds, and beaches without permanent occupants, that are empty for large portions of time. Jacobs (1969) and Newman (1972) have both described the security advantages of places built on a personal, territorial scale. The chief methods for accomplishing this in public housing projects have been to divide up large spaces into smaller spaces that can be defended more easily, and marking them in distinctive patterns associated with particular apartment units. While appropriate to the residential environment, these procedures have little meaning in commercial, transportation, or school settings without permanent occupants. To link together defensible space in public and private settings, one must learn how to increase positive protective attitudes toward public buildings.

Target hardening, which has occupied most of the attention of defensible space planners, is not likely to encourage protectionist attitudes if it is done insensitively. Fortress-like structures in the midst of residential neighborhoods will not inspire local identification. Such buildings give the appearance of being constructed to keep the community at bay. Public buildings convey an image of government to neighborhood residents, and in their minds express the government's attitude toward them. A school resembling a prison complete with asphalt yard and high

fences topped with barbed wire, or the post office seemingly built to be defended against urban guerrillas, expresses distrust and hostility on the part of the government towards its citizens. The physical separation of such buildings from the neighborhood creates misunderstanding between people who work in the building and those in the surrounding areas. Yet there is nothing in the defensible space conception that requires ugly or disliked buildings. Indeed, the aim of making space defensible is just the opposite--to increase the identification of tenants with buildings and grounds. An understanding of how defensible space notions can be modified to fit the public environment can help avert the construction of civic buildings no one will defend because they are universally resented.

Relationship of This Paper to CPTED Approach

The two major components of defensible space are surveillance and territoriality (Newman, 1972). Surveillance means good visual access to the environment. Territoriality, as the concept has traditionally been used, has two components, defense and personalization. Defense refers to the willingness of the owner to protect the space; personalization to the ability to mark the space, to render it distinctive, conveying a sense of familiarity and possession to the occupant, and the message of "keep out" to those who do not belong there. It is the thesis of this paper that personalization ^{to defense can also be applied in} ~~is the best link in understanding the defensible space~~ ~~notion~~ non-residential settings. The challenge is to instill protectionist attitudes in people who do not technically own a building or occupy it on an extended basis--casual users, people living nearby, visitors.

With full recognition of the importance of other components of CPTED, including good street lighting, controlled access, etc., the specific concern of this paper is with methods towards increasing proprietary and protectionistic attitude toward the public environment. While most of the discussion will concern methods of increasing territoriality, this will indirectly affect surveillance. To open up public buildings for multiple uses or create space for a live-in caretaker will put more "eyes in the building." To transform a vacant, litter-strewn lot into a community garden will focus more "eyes on the streets." Three methods for increasing protectionistic attitudes towards public spaces will be discussed: creating permanent occupants, multiple usage, and personalization.

A Note of Caution

From time to time, I will be presenting examples of how CPTED can be extended to public buildings along with some preliminary results. These examples should be considered as indications of promise rather than as proof of success. Very few of such programs have been systematically evaluated. The best that is available are the statements of a horticulturalist that community gardens reduce crime in a neighborhood or the assertions of a school administrator that multiple use of school buildings reduces vandalism. Rarely are any statistics presented. On the other hand, there are some programs whose good points are so obvious that they do not need documentation. An attractive community garden yielding flowers and fresh vegetables is obviously desirable in itself. The same is true of a colorful and attractive mural reflecting the culture

of the area's residents on what had previously been a bare graffiti-covered wall, or a sports program that converts the rubble of an unstarted development project into a sandlot ballpark. Such programs that involve tangible improvements, as perceived by local residents and visitors, do not need to be justified on other grounds.

Measuring change is a complicated business. Any program can have primary, secondary, and tertiary effects. Primary effects are its direct impact upon the lives of people or physical aspects of a neighborhood. The creation of a sandlot ballpark will involve the labor of local residents the transformation of a physical setting, and a probably increase in sports activity. These are direct and tangible effects, measurable in hours, dollars, or square meters that have been physically altered. Secondary effects are the channeling of energies away from destructive into constructive activities. Tertiary changes involve the spread of the activity into other realms, both behavioral and geographic. The creation of a sandlot ballpark in a neighborhood may increase the demand for more adequate street lighting, as well as create the demand for a ballpark in other neighborhoods. Such changes tend to be interactive. When more people are on the street watching a sports event (a secondary change), surveillance is improved and crime may be reduced during those periods. This reduction in crime may in turn encourage more people to involve themselves in sports activities (primary effects).

With recognition that any reduction in crime or vandalism may be a secondary or tertiary rather than a primary effect of CPTED, let us move on to examination of ways for transforming anonymous, unowned and untended

public spaces into community territories. Although the specific programs do not have universal applicability, it is hoped that the general principles underlying them will.

1. People in the Buildings

The easiest method of territorializing public space is to bring in permanent occupants with round-the-clock authority over the area. This would be a fairly novel approach in most civic buildings. We do not expect to find people living in the public library, homesteading in the county park, or occupying a live-in trailer in a school yard. We have grown accustomed to a geographic separation between public and the private realms, between state land which is controlled by the authorities and private turf which is controlled by individuals. Mixing the two seems confusing and open to all sorts of abuse. Yet there is a large amount of good useable space in public buildings that is deserted most of the ~~day~~^{Time} leaving the buildings to become ripe targets for vandalism. Some of these buildings already have a round-the-clock presence in the form of police and security guards. These guards do not live on the premises, but only walk the halls. This is a relatively expensive means of gaining security since it requires several shifts of personnel every day, and on weekends and holidays, and there are few secondary gains from it. Creating permanent occupants may accomplish the same level of security more cheaply as well as providing needed housing.

~~Let us examine some of the ways in which permanent occupants have been brought into public buildings as a means of reducing crime and vandalism.~~

School buildings are one of the target areas for application of the CPTED principles. Typically the school building is deserted most of the day and all of the evening, making it a ripe target for vandalism. Several school districts in California have begun Project Vandal Watch, in which the school district prepares mobile home sites and either invites occupants of mobile homes to move their units onto school grounds and live there rent-free, or the school district itself buys or rents mobile home units, moves them onto school grounds, and makes them available to families rent free. The practice is similar to the rural "teacherage" which used to be found adjacent to country schools at the turn of the century. The teacher would be provided with a small house next to the school building and in return was expected to keep an eye on things when school was not in session. The California program began in the Elk Grove School District with one college student living rent-free in a trailer at one of the elementary schools. During the next five years, there was not a single incident of breaking in or vandalism at the school. The apparent success of the program induced the district to expand it to 15 of its 17 schools with a two-thirds reduction in overall vandalism. The program has since spread to other districts in California and out of state. The basic details of the program are like this:

The district prepares a trailer site on school grounds, at a cost of somewhere around \$3,000. This is made available to families who already have trailers. The district pays for utilities, except for gas and telephone, and selects families from a waiting list. Most of the occupants are

couples, but there are also single parents and children, young couples without children, middle-aged and retired couples. The occupants find the task very satisfying. For some of the retired couples, ^{the} opportunity to be useful, to be around active young people, but still to have their own space, and the economy of rent-free accommodations. For younger couples there is the abundance of space around the school yard in contrast to the usual confined mobile home park. The approach seems practicable in most any school setting. It is noteworthy that the tenants thus far have not been paid for their services except for rent and utilities. The economy of the program relative to 24-hour security guards is evident. A primary benefit of the program is a reduction in insurance rates for the school buildings. As vandalism decreases further, continuing savings in insurance premiums are expected (Westin, 1974).

Real estate companies know that the quickest way to have a house deteriorate is to leave it unoccupied. It is much more economical in the long run to rent it to trustworthy tenants, even at reduced rates, than to hire a landscape service to maintain the grounds and a security force to keep away vandals. Fences may keep out marauding animals and screens may keep out insects, but people provide the only secure protection against predatory people. Human intruders are capable of so much variation in their tactics that they can outwit any electronic gadgetry. The best security in dealing with a potential marauder as ingenious as humankind involves the presence of other people who have an equal capacity for modifying their behavior to suit new conditions.

Analogous to Jane Jacob's notion of eyes on the streets, the principle here is one of people in the buildings. Using the proprietary impulses of people who guard an area because they live there seems more effective and socially desirable than bringing in external security people. As with the other CPTED methods, the police are still available as a back-up force, but the primary task of showing vandals that the space is occupied as well as protected is done by the live-in occupancy. The advantages of the program are economy relative to 24-hour security guards, the more relaxed atmosphere provided by live-in families also relative to security guards and expensive alarm systems, and the social desirability of the additional housing that is provided.

Fire houses and police stations typically have round-the-clock occupants and a low rate of vandalism. Perhaps this is understandable in a police station or other law enforcement agency, but not in the fire station. There is every reason to suppose that a fire house with all its gleaming fire engines and equipment would be a more attractive target for young vandals than a cemetery or school building, which are places more commonly hit. It is a reasonable hypothesis that the round-the-clock presence of the fire fighters in the station constitutes a major deterrent to malicious mischief. The fire house, incidentally, is a good example of an extremely functional civic building which provides space for live-in occupants.

The \$1.3 million new governor's mansion in California sat empty for several years because the new governor did not want to live in it.

During that period state police provided 24-hour security at a cost of over \$30,000 a year. In November, 1977, two couples were hired as live-in caretakers in the never-occupied mansion. In return for an \$800 monthly salary, each couple would be expected to put in 20 hours of work cleaning the building, tending the grounds, washing windows, and protecting the building against intruders. The method is expected to be more economical than the police presence and a financial boon to the two families living there. Housing codes may have to be modified to permit families to occupy certain public buildings. An historic landmark may not have the proper wiring for a stove or telephone. This is where the separate mobile home becomes advantageous. Depending upon circumstances, some live-in quarters may have sleeping but not cooking arrangements, or be suitable for adults but not children. A proper fit must be arranged between type of structure and the type of caretaker.

Resistance to the Program

Creating private territories in public buildings runs counter to the American belief that public means equal access for everyone. Because city buildings belong to "everybody," no one should be allowed to territorialize them. Some people would feel uncomfortable at the thought of a family living in "their city hall" or in the public library. However, the dream of public turf being open to everybody is illusory at best. The public park that is too dangerous to walk through in the evening is hardly open to everybody. The situation is analogous to the anonymous no-person land

around the high-rise towers described by Oscar Newman. Rather than being open to everybody, the space belonged to nobody and was unuseable by anyone except criminals. Converting this space into territories increased rather than decreased the occupants' effective control over their surroundings. If the presence of a family living in a civic building could extend the hours in which the building was available for general use, the public has not lost but gained from granting control over the apartment area to its occupants.

In theory, there are very few public buildings or spaces that could not be at least partly territorialized. The idea may seem strange at first, but there is no reason why there could not be a caretaker's cabin in a city park or on a county beach. There is ample precedent for this in ranger's cabins located in state and national parks. One cannot argue that a caretaker's family would object to living in a public park or on a county beach without seeing if this is the case. Many occupants of the tiny crowded substandard apartments in dense noisy areas would be overjoyed to have a small house in a park or on a lake. Aesthetics could be handled by good design. I have never heard a park visitor complain about the presence of a ranger's cabin, including a laundry line out in back. Most people felt reassured by the sight of the cabin and the thought that someone would be available if an emergency arose. Live-in caretakers could be appropriate in clinics and hospitals, historical monuments and libraries. I can imagine many couples, both young and elderly, who would enjoy having

an apartment in the rear of the public library. There is ample precedent for live-in staff on the grounds of mental hospitals. I lived for years in a staff cottage in a mental hospital. The residential staff served as "eyes on the buildings" at times when there are not many other employees around. If a patient showed signs of acute disturbance or if someone were injured, we were there to provide help or summon assistance.

The security needs of the caretakers must also be considered. In theory, a young couple living in a mobile home in a dark, isolated school yard, would be a prime target for robbery or assault. Fortunately, such occurrences have been rare in the programs mentioned. Many caretakers are provided with alarms or telephones to summon outside assistance and some have their own watchdogs living with them. Criminals tend to be specialists in certain types of crime. Those who burgle houses or vandalize public buildings will try, if they can, to avoid direct physical confrontation with authorities. Those who want to rob, assault, or rape are not likely to actively seek out security-conscious caretakers on the caretaker's own turf where there is probably an alarm system, watch dog, etc. While the security needs of the caretakers are a legitimate concern of authorities, the evidence thus far is that the presence of a caretaker makes a setting a less attractive target.



2. Multiple Usage

One problem in applying CPTED to public buildings is that they are empty most of the ~~day~~^{night}. This makes it necessary to bring in security guards and make constant police patrols. A different approach is to attempt to bring the public back into such buildings after hours, to obtain more "eyes in the building" through scheduled evening, weekend, and holiday activities. This also provides valuable additional space for community and club recreation, and cultural activities. The Elements of CPTED report (Tien, Reppetto, and Hanes, 1976) consider such multi-use programs as outside the defensible space conception. It is the thesis of this chapter that multi-use, by increasing both territoriality and surveillance, is critical to the application of CPTED to public buildings. Only the historical accident of Newman beginning his defensible space work in housing projects where multiple use is not so critical, makes ~~them~~^{it} seem peripheral to CPTED. Had Newman begun his work by attempting to protect schools, courthouses, and city storage yards, it is probable that the multi-use concept would have figured more prominently in his recommendations.

The multi-use concept has been applied by the Archdiocese of Chicago to keep down vandalism at its cemeteries. Most cemeteries have been faced

with two different sorts of crime, lark vandalism which involves headstones being knocked down or broken, paint smeared over monuments, or people driving through the grassy areas, and professional crime which involves the theft of bronze statues, lawn equipment, watering pipes, and anything saleable. Faced with these problems, most cemeteries have attempted to harden up with sturdier fences, more sophisticated alarm systems, and more security guards. However, the Archdiocese of Chicago went the opposite route of opening up to more public use. Instead of old-style solid fences, they erected fences which were "decorative and inviting rather than forbidding." The new fences also increased public surveillance from the surrounding streets. They encouraged use of the cemeteries by walkers, joggers, bicyclists, and birdwatchers. It became evident that many cemeteries made excellent nature study areas. Two researchers found 95 bird species in Boston cemeteries as well as 20 mammal species, including raccoons, skunk, foxes, woodchucks, squirrels, opossums, muskrats, and cottontails, all in the heart of a major metropolitan area. According to John T. Philbin, the Executive Director of the Chicago Catholic cemeteries, the combinations of increased public access and fence renovation decreased the amount of lark vandalism. ^P Many cemeteries have little connection with the surrounding neighborhood. Because of population shifts, people who used to live in the central city have migrated to the suburbs leaving the cemetery as an enclave in a neighborhood populated by other ethnic groups. Inner city youth see the fancy cars driving to the cemetery on weekends and feel little connection with the fenced and patrolled green space to which they are denied access. Cemeteries in Boston and its suburbs occupy

35% of the open space remaining in the area (Thomas and Dixon, 1973).

The methods used in Chicago seem a classic application of CPTED principles. The inviting see-through fence increased public surveillance and the use of cemeteries as parkland enhances community involvement in them.

The Human Resources Center in Pontiac, Michigan, is a school that was planned and built to serve a variety of community needs, including the needs of citizens of all ages. Early reports are that the school succeeded in generating community interest, providing vocational training, and reducing criminal activity in the surrounding area (Tien, Reppetto, and Hanes, 1976).

The varied uses must be compatible but they need not be similar.

The provision of meeting rooms in a ~~new~~ subway ^{station} ~~system~~ with foul air *is jarring noise* would not work. But if the stations were well-ventilated, well-lit, and relatively quiet, such as San Francisco's new BART system, it might be feasible. Montreal has specifically designed its metropolitan transit system to interface with its educational system (Lincourt and Parnass, 1970). This allows students to make use of museums, theaters, scientific, and technical establishments anywhere in the city. The display of artwork and cultural artifacts in metro stations has been successfully applied in Mexico City for some years. A combination of ingenuity, community input, and perhaps some minor structural changes can develop multiple uses for most any public building or open space. At first there was considerable resistance to locating the Tavern-on-the-Green in New York City's Central Park. Environmentalists resisted the idea of any development of Manhattan's remaining green space. Yet the magnitude of crime and vandalism made the park unuseable to most of the population most of the time. The presence of

a tavern and other related services, and opening up the parks in the evenings for concerts and cultural events, brought a level of security that constant police patrols had never been able to offer. The provision of facilities for evening activities, including lit tennis courts and concert areas, provided "eyes in the park" during the evenings.

3. Creating Territories Through Community Arts and Gardens

A. Murals

Several years ago, while working on a book about mural painting (Sommer, 1975), I traveled to various cities around the country to observe community arts programs. This was an unfunded venture, and the trips were usually connected with speaking engagements, so there was no time for systematic investigation. Hopefully, what was lacking in depth was compensated for in breadth. Most of the major cities in the country were visited, and several hundred murals, mosaics, and sculpture were photographed. The New Mural Movement was different from previous arts programs in several ways. The art was created on the streets and many of the artists were nonprofessionals. The last great surge of mural painting in this country occurred in the 1930's as part of the WPA program, but the WPA work was largely painted indoors and almost entirely by professional artists whose designs were selected in formal competitions. The New Mural Movement stressed community involvement. If painting was to be done on the streets over a period of weeks or months, it needed the respect of local people or it would not survive. In New York City, Chicago, and Los Angeles, professional artists were hired to coordinate city-sponsored

arts programs. The artists worked with local groups to locate suitable walls, obtain the permission of landlords, find the paint, brushes, and scaffolds, and then plan, paint, and finish the mural.

What emerged from my visits and discussions was the conclusion that the murals protected walls and buildings against vandalism. Finding a mural hit by graffiti was the exception rather than the rule, and it was invariably a source of shame to the artists and to the community. Frequently the mural artists worked in the highest risk neighborhoods because these were the only walls available. The Los Angeles County Parks Department found that a few murals were damaged, but most were left spotless. The program was judged to have been a qualified success (Sunset, 1973). When I visited the Estrada Courts Housing Project in Los Angeles, a drab and depressing aggregation of wooden barracks brightened considerably by the appearance of almost 80 murals, not a single mural had been hit by graffiti, although virtually every wall on adjacent buildings and in the neighborhood outside the project was covered by plaques and other forms of wall writing. The contrast between the unscathed murals and the adjacent areas was impressive.

A newspaper report described how artist Arnold Belkin painted a large mural for a playground in the Hells Kitchen area of New York City. Belkin developed a large amount of community support for the work and a year afterwards there was not a single extraneous spot, line, or number defacing the mural. When a gang from 51st Street arrived one day armed with cans of green spray paint and threatened to attack the wall, local kids gathered in front of it and warned the invaders that they were risking their lives if they put one spot on the wall. Jerry and Sally Romotsky, an artist-writer team who have documented the activities of Chicago street gangs in

Los Angeles (Romotsky and Romotsky, 1977), found that the gangs rarely disturbed actual works of art. While many barrio walls were covered with script, genuine murals were spared. There were numerous instances where landlords invited mural artists to paint their walls as a means of reducing the amount of vandalism to their property. This was particularly noticeable on the sides of mom-and-pop grocery stores in East Los Angeles. Stores with murals had their walls respected.

For most of its 40-year existence, the pedestrian tunnel into Oakland, California's 44-acre Lake Temescal Park had been plagued with graffiti. As fast as they were painted over, the scrawls reappeared. Often they were offensive, giving rise to frequent complaints which necessitated the park department sandblasting the tunnel several times a year at a cost of \$400 each time. The advent of the spray can, which improved the efficiency of graffiti writers, made matters worse. In 1967 a young Dominican monk studying for the priesthood who walked through the tunnel to get to a nearby college, was troubled by the racial epithets and proposed a mural to the authorities. The Park District enthusiastically accepted the offer and provided paints as well as applying a white coat of enamel as a base. Other students at the seminary as well as local teenagers joined in painting the mural which became a neighborhood attraction. In the ten-year period of the mural's existence, it is still in excellent shape. (Young¹⁹⁶⁷). The same artist was later asked to paint a retaining wall along one of the park's roads, also a favorite spot of graffiti writers. This mural too has remained intact for almost a decade. Heartened by the success of these

projects, the Park District decided to decorate several of its portable toilets. There had been frequent instances of vandalism of ~~the~~ park ~~district's~~ toilets, some 35 of them being damaged or destroyed during the previous year, a few with axes, and others with doors pulled off or ripped apart. A park employee who was an amateur artist, painted several of the outhouses in 1972 using themes (flowers, trees, etc.) appropriate to the park. The outhouses remained intact during their several-year life span. The same Park Department employee later applied his brush to several litter cans which, according to Park Department sources, (but not confirmed in actual surveys) were more heavily used afterwards (Young, 1967).

Not every attempt to substitute murals for graffiti succeeds. I saw several tunnels along Chicago's Lakeshore Drive where colorful abstract designs had been badly hit. I don't know if this would have occurred if the murals had been more in tune with local values and street gangs had been involved in the painting, but it is clear that not every mural can protect every wall against vandalism. However, the effort is still worth a try, not only because of the small expense and the greater aesthetic value of the murals, but also because it provides an opportunity for young people to apply their talents to improving the environment. The presence of "their mural" increases territoriality. Walking around neighborhoods to photograph murals, I was frequently approached by teenagers who wanted to show me their personal contribution to a wall or another mural done by their gang. The content of community murals tends to be positive and affirmative. The most common themes for community-painted walls were peace, brotherhood, and cultural survival. While I have seen numerous

anti-heroin murals, I have never seen a single one that was remotely pro-heroin. The wall paintings tend to express the aspirations and yearnings, the best impulses of the community.

School buildings are favorite targets of graffiti writers. This is partly due to the presence of so many young people since graffiti tends to be a young person's form of vandalism. Another cause of the vandalism is the ugly prison-like appearance of the buildings--acres of grey asphalt surrounded by a cyclone fence topped by barbed wire, the only vitality and color and sound supplied by the young people themselves. To keep down vandalism, some school districts have prohibited children from using the buildings after hours. The school became a prison for the children during the day and a fortress against the community afterwards.

Some writers (Crowe et al., 1976) believe there is a reciprocal relationship between the quality of a school building and vandalism. The appearance of graffiti or broken windows tends to lower people's respect for a building and thereby increase the chances that it will be damaged further. The vandalism may also contribute to negative attitudes toward children and teachers of the school and toward the neighborhood itself. Instead of the school being a positive example of constructive neighborhood activity, it is an indication of deterioration and decay. Improving the school can reverse this cycle of continuing defacement and negative attitude.

The San Francisco Unified School District attempted to break this cycle of ugliness-defacement-more ugliness, by making the yards more attractive and inviting children in rather than keeping them out. The

current program began in 1971 at the McKinley School with the creation of brightly-colored play structures, a giant mural on one side of the school building, and an art program run by a professional painter. The program was launched with a \$10,000 grant through the Emergency School Assistance Act. The money went primarily for materials and the services of a professional designer. The actual construction and painting was done by parents, children, and teachers. The success of the program encouraged other schools to join in, using money from the Model Cities Program, general revenue sharing, and community donations. By 1975, some 56 San Francisco Schools had greened their yards. According to district officials, the success of the program has been evident in the voluntary efforts of students, teachers, and parents involved in such projects as creating and installing stained glass windows (left intact), planting a thousand daffodil bulbs at one school, and laying mosaic tile around a fountain. As a secondary effect, school officials report that vandalism in the decorated yards has dropped perceptibly (Blum, 1975).

B. Community Gardens

The community garden is another means of increasing territoriality in the city. Converting a vacant litter-strewn lot owned by the city or distant landlords, into a vital and productive community green space, can be a source of individual and neighborhood pride. The Plant-People Project of the American Horticultural Society has been operating in low income housing projects for the past six years. Horticulturalists and garden clubs have donated their services, tools, cuttings, and helped secure funds for gardens started and maintained by inner city residents.

The New York City Housing Authority provided to any group of tenants who applied for it, a garden site on the grounds of the project, assistance in preparing the ground, structural material, and \$25 for the purchase of seeds, plants, tools, and fertilizer. There was a great deal of pride in the gardens and vandalism was rare. When it occurred, immediate replanting was the best antidote to further depredations. Each group devised its own means of dealing with vandalism. One group posted look-outs in high-rise buildings, another used foot patrols, another assigned neighbors to guard the gardens at times of high risk. None of the groups ~~Lewis noted,~~ asked for police protection. They knew their turf and the best ways of protecting it (Lewis, 1976).

According to Charles A. Lewis, the coordinator of programs in New York, Philadelphia, and Chicago, "vandalism has been reduced, streets were cleaned, buildings repaired and painted, vacant lots rehabilitated into gardens and playgrounds, and a new sense of neighborliness and sociability developed" (Lewis, 1972; Lewis, 1973). These benefits were secondary effects of the gardens, not directly part of the original program. Lewis explains them in psychological terms as improving the self image of the ghetto gardener. Unlike graffiti or vandalism, a garden has a positive and not a negative impact on the environment. Preparing the soil, growing, and protecting the garden will bring opportunities for social contact with neighbors and increases the sense of community. In terms of CPTED principles, vacant, litter-strewn lots which had been a source of alienation and a reminder of the community's lack of control over its resources, and

probably a forbidden place) after dark, can become an individual or group territory ^{to this process} ~~while the process of territorialization~~ increases feelings of competence and achievement. Besides this, there are the pleasures of tasty fresh vegetables, flowers, and the other fruits of the garden. Horticulturalist Lewis emphasizes the sense of responsibility plants bring. Plants are alive, and dependent upon the gardener for care. In a world of constant judgment, plants are non-threatening and non-discriminating. They respond to the care that is given them and provide a benevolent setting in which the person can develop feelings of competence. They follow rhythms different from those of the human environment. Their growth is regular and predictable, not erratic and bizarre. The young gardener learns that change need not be disruptive. It can be part of a larger order that touches enduring patterns of life (Lewis, 1975).

Programs of community beautification tend to be expansive in time and space. Perhaps this is the reason why some community officials resist them. Cleaning up one filthy vacant lot or rehabilitating a decrepit house emphasizes the condition of its surroundings. When the young people in the neighborhood see a vacant lot being turned into a community garden they may raise the issue of converting another empty field into a sandlot ballpark. When the residents of housing projects in Chicago began creating flower beds out of what had previously been untended litter-strewn lawns, they sought permission to repaint and rehabilitate some of the project's buildings. Among other results were bright murals on walls around the gardens.

The result in CPTED terms is increased neighborhood territoriality. Vacant areas are converted from unowned, uncontrolled ugly spaces to attractive community-controlled and maintained spaces. From being fields of fear and illicit activity, they become places of community interest and constructive purpose. The presence of people tending the fields and the residents' proprietary interests in their crops keeps more eyes on the street. People begin to care what happens in the garden and surrounding areas. There are numerous accounts of local residents defending their gardens against outsiders. Increased territoriality is apparent in both language and behavior ("My plot," "My garden," "My tomatoes out there," etc.). Thus the two criteria of territoriality, personalization and defense, are satisfied. Surveillance is improved by having more people working in the garden (more eyes on the field) and increasing community interest in the area. Like murals and sandlot ballparks, the gardens are linked to CPTED through both an increase in territoriality and improved surveillance.

C. Resistance to the Program

Most artists are notably apprehensive at the idea of advocating arts programs on the basis of their instrumental value. They believe that subjects like music and painting and sculpture are important in their own right. Several recent articles have maintained that instruction in the arts helps students learn math, science, and other core subjects (Williams, 1977). While welcoming such findings, arts educators resist the idea that art should be taught strictly for its instrumental value in

other subjects. There will also be resistance to funding community arts programs as a means of increasing residents' territoriality or combatting vandalism. Such objections are based on a simplistic model of social purpose. Programs rarely have a single goal, but many, some stated and some not. The WPA mural program of the 1930's had, among other goals, the provision of salaries for unemployed artists and the beautification of public buildings. The arts community was primarily interested in the employment of artists while most of the legislators who voted for the program were more interested in the beautification of public buildings. A similar multiplicity of objectives characterizes community arts programs. The Watts art festival in Los Angeles and Boston's Summerthing Program were specifically begun to keep the streets cool in the summer. That the methods included dance workshops, concerts, chalk art festivals, and mural programs was incidental to many ~~of the~~ sponsors.

CPTED program administrators need not act as if a reduction in crime ~~and~~ ^{and} vandalism are their only desired objectives. They share a ~~community~~ ^{commonality} of interest with those who want to improve neighborhoods, renovate abandoned buildings, and develop community gardens because they are attractive. Increased territoriality and neighborhood beautification should go hand-in-hand in CPTED programs. Just as the defensible space in housing projects depends on the residents' natural inclinations for security, CPTED in regards to public buildings rests on people's desire for an attractive, ~~and~~ ^{secure} responsive, environment.

Defensible space operates in two major ways. The first is through the perception of the potential offenders who prefer to operate on their own turf or in areas with low social cohesion, where ~~his~~^{their} presence will not be challenged. Neighborhood security can be improved by creating perceptual cues for the potential offenders that there is an involved and active citizenry. Defensible space can also operate by changing the behavior of the residents. Improved surveillance through windows, prompt reporting of crimes, and confronting suspicious strangers, all encourage potential criminals to look elsewhere. Murals seem to emphasize the former mechanism, by symbolizing to the potential offender that there is a strong and cohesive social fabric. The other two approaches mentioned in this paper, people in buildings and multiple uses, offer no such cues. They would function more by additional surveillance or eyes-on-the area, and the resulting possibility for increased crime reporting and perhaps active deterrence, than by symbolizing an environment which is not an easy hit.

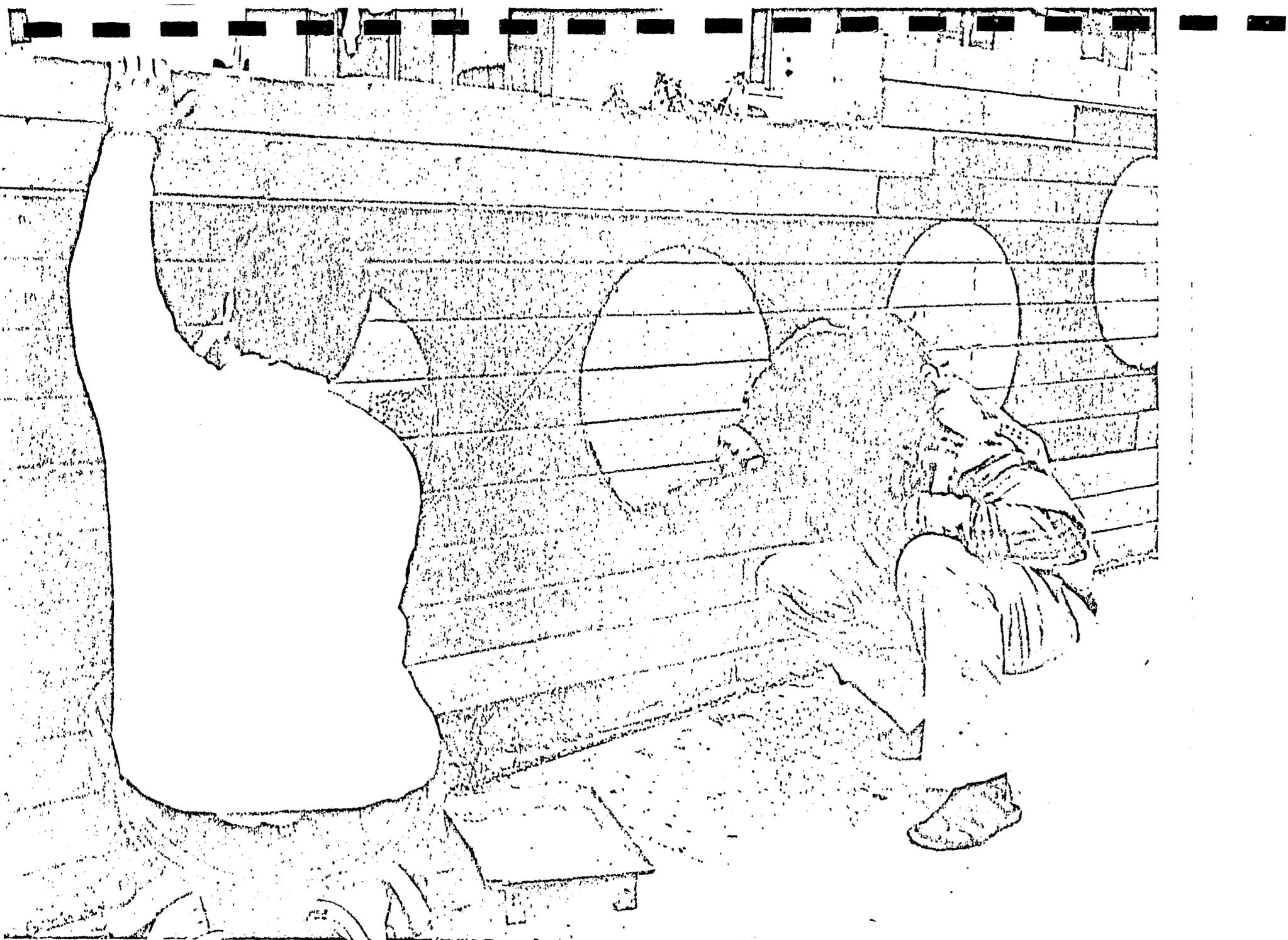
The presence of a concerned community can encourage positive feelings in the potential visitor to the downtown area by reducing fears of criminal victimization. This, in turn, could increase the usage of the area with concomitant benefits in increased sales, attendance at concerts, films, etc. An impressive program of repainting is credited with reviving Detroit's Eastern Produce Market area. Through the Merchants' Assistance Program funded by the city government, local store owners are able to apply for assistance to brighten up building exteriors, provide additional street furniture, plant gardens, etc. According to Victor Rogers, Director of

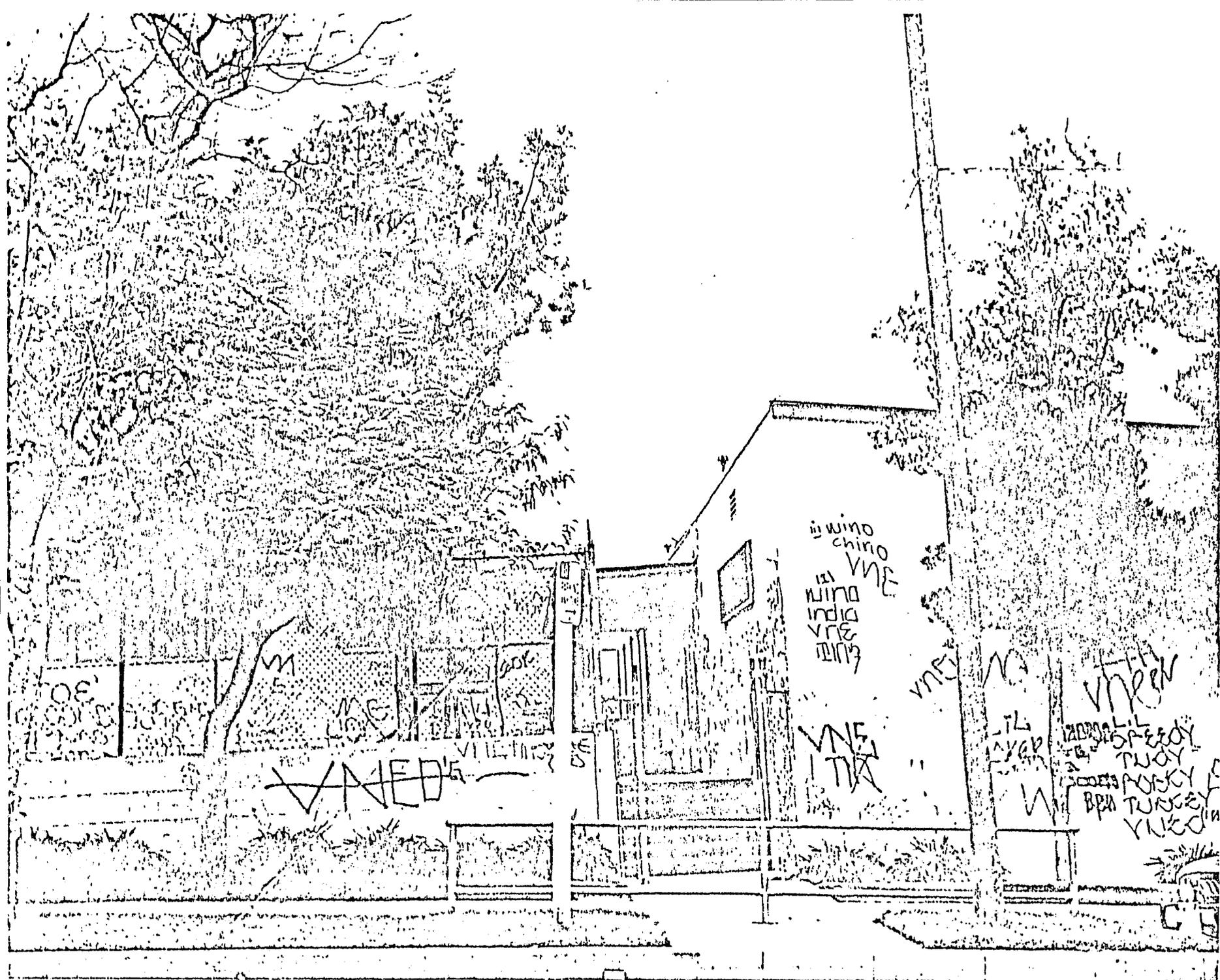
Markets for the city, the vivid super-graphic designs "woke up the public. It made people aware that this is the Eastern Produce Market. It stimulated a lot of action. People are curious, they come down here to the market to see what is going on." Rogers added that in his 27 years with the city, "We couldn't get some of these people to sweep their sidewalks. Now they are spending thousands of dollars to fix up their buildings." (Williams, 1973) The painting is credited with sparking an economic revival in the area. Like many renovations/restoration projects (Old Portland, Underground Atlanta, Old Sacramento), the security of the residents is increased by new activity, but from the police standpoint, new security problems are created by the presence of an affluent public in a previous skidrow area. The need for improved street lighting and more police patrols may be seen by authorities as a drain on already scarce resources. Hopefully, defensible space notions can be applied to reduce the load on the police and the taxpayers. Improved surveillance through better street lighting, limited access and egress to the restored district, and mixed-use activities (apartments and convenience stores as well as bars and boutiques) will provide more eyes in the street and more security for residents and visitors alike. The effects of measures discussed here are interactive and multiplicative. The adoption of any single program will create pressures for additional ones which will strengthen *the* initial programs.

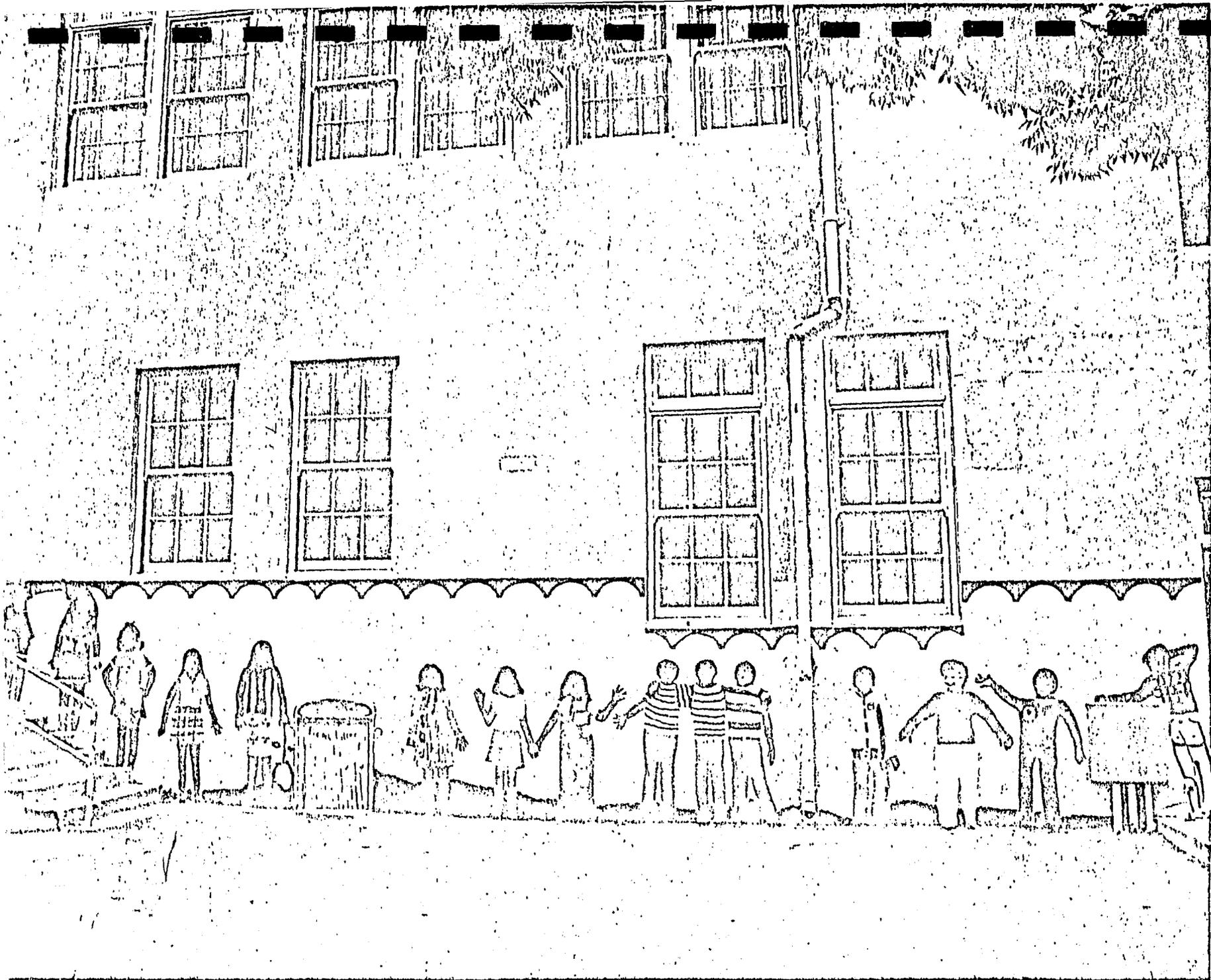
Picture Captions

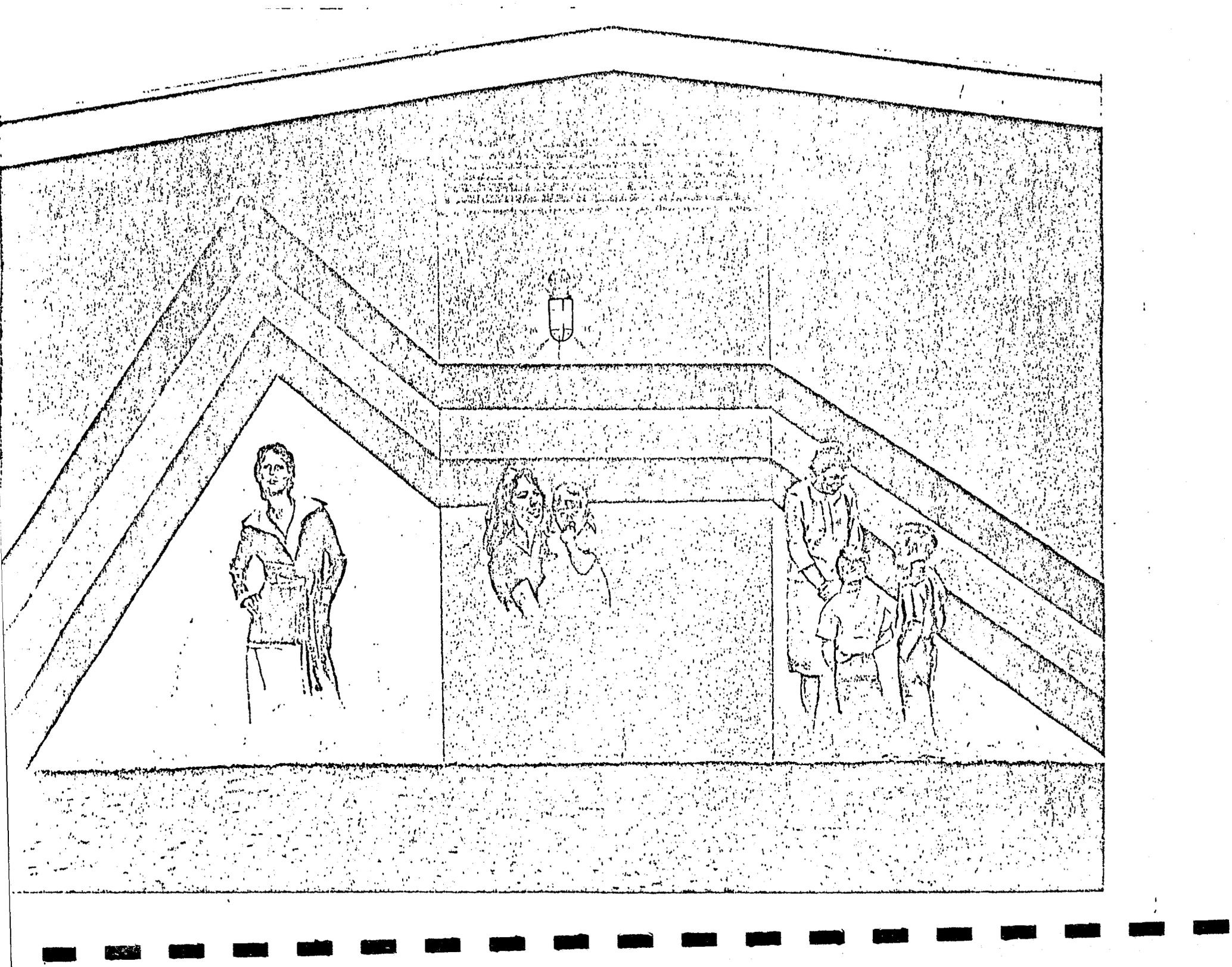
1. (271A) Graffiti covered wall at Estrada Courts housing project in East Los Angeles prior to the painting of a mural.
2. (270) Young residents of Estrada Courts housing project in East Los Angeles painting the brick fence surrounding the project under the direction of self-taught Chicano artist C. W. Felix. The young people were paid with funds from the Neighborhood Youth Corps. Artists in the Los Angeles area have volunteered their services as advisors.
3. (272) School directly across from the Estrada Courts housing project in East Los Angeles. Virtually every wall was covered with graffiti. None of the murals on the project across the street had been touched by graffitists at the time of the writer's visit.
4. & 5. (117-19, 117-19E) Murals painted by children, parents, teachers, art classes, and outside artists brightened up otherwise drab depressing prison-like school yards.
6. (117-2) Los Angeles mural by Robert Ayala completed in 1972 as part of the city-sponsored public arts program. Notice the sign painted in the mural, "This is your barrio (district). Please don't write on your walls."
7. (59) This retaining wall in Oakland Park had been a favorite target for graffitists for many years until a bright mural of California poppies was painted by a volunteer artist. The wall has been left intact for almost a decade. (Photograph courtesy of East Bay Regional Park District).

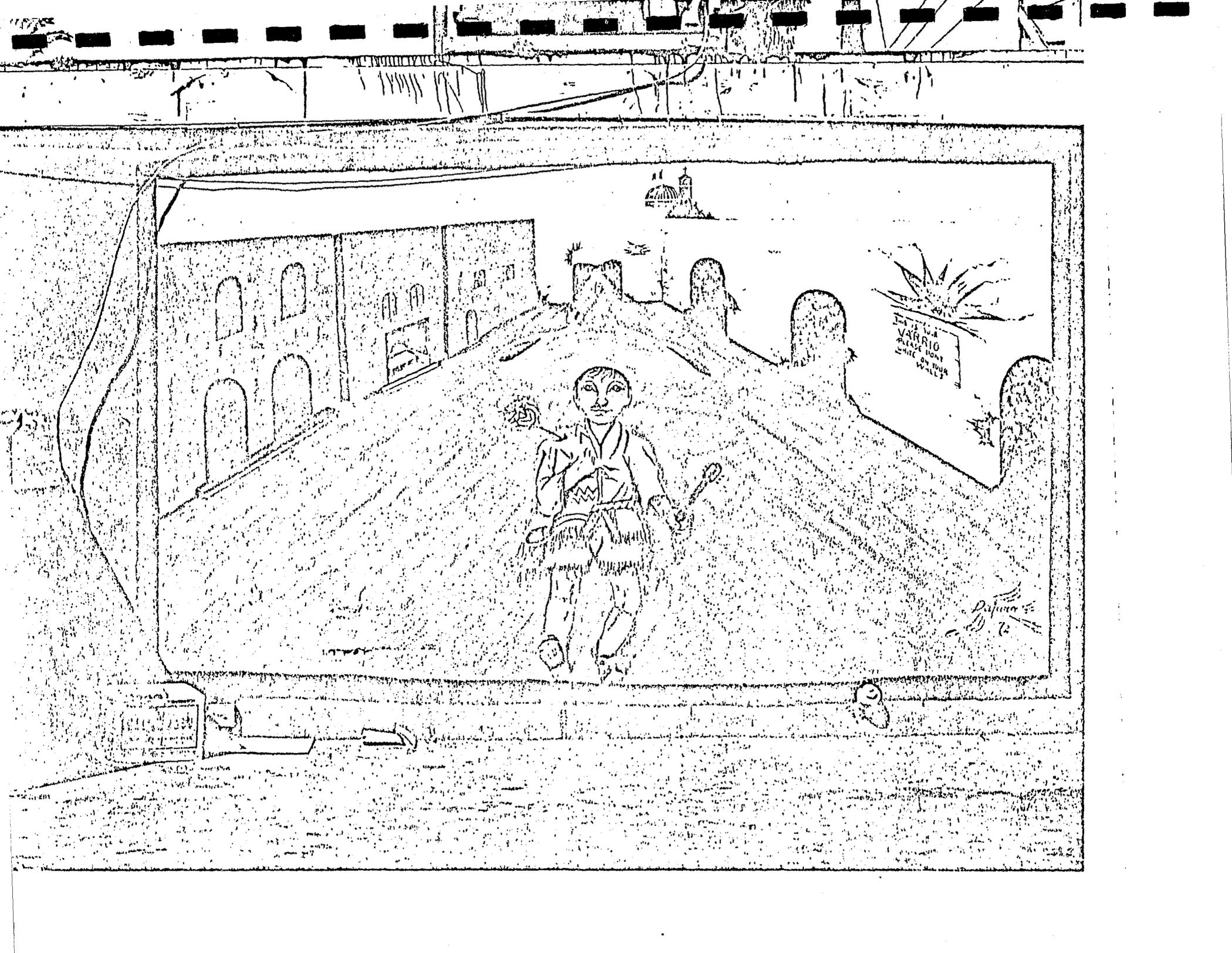
8. (134) Detroit's Wall of Pride, painted by twelve local artists and organized by artist Jim Malone, depicts famous black Americans. It was intended to increase the territorial identification of almost exclusively black residents with their neighborhood and culture.
9. (257) This mural was painted by youth from the Chinatown Boys Club to brighten up a small playground.
10. Ad hocism. Improvised furniture in a community-created park on vacant land owned by the Bay Area Rapid Transit District, Berkeley, Ca.



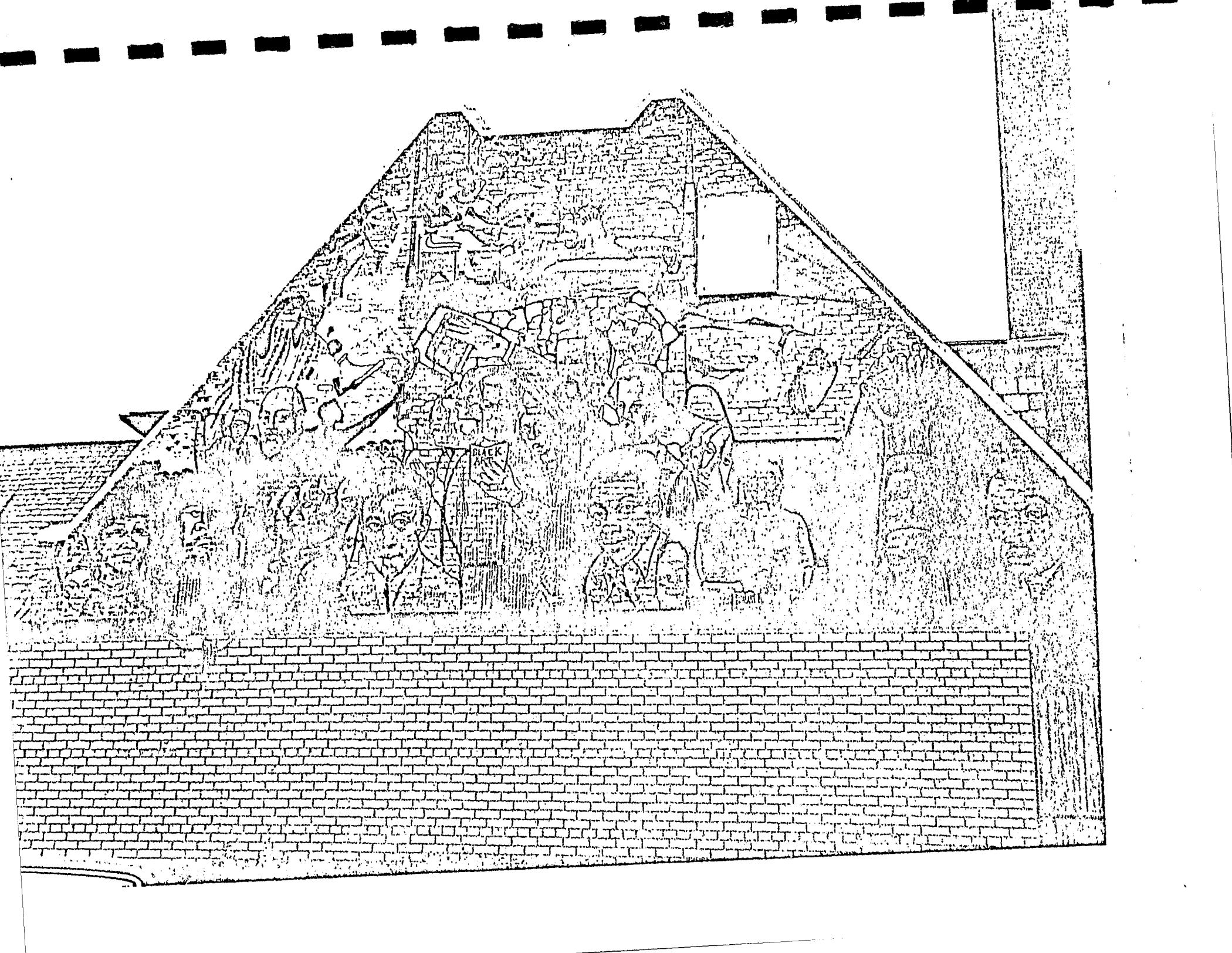


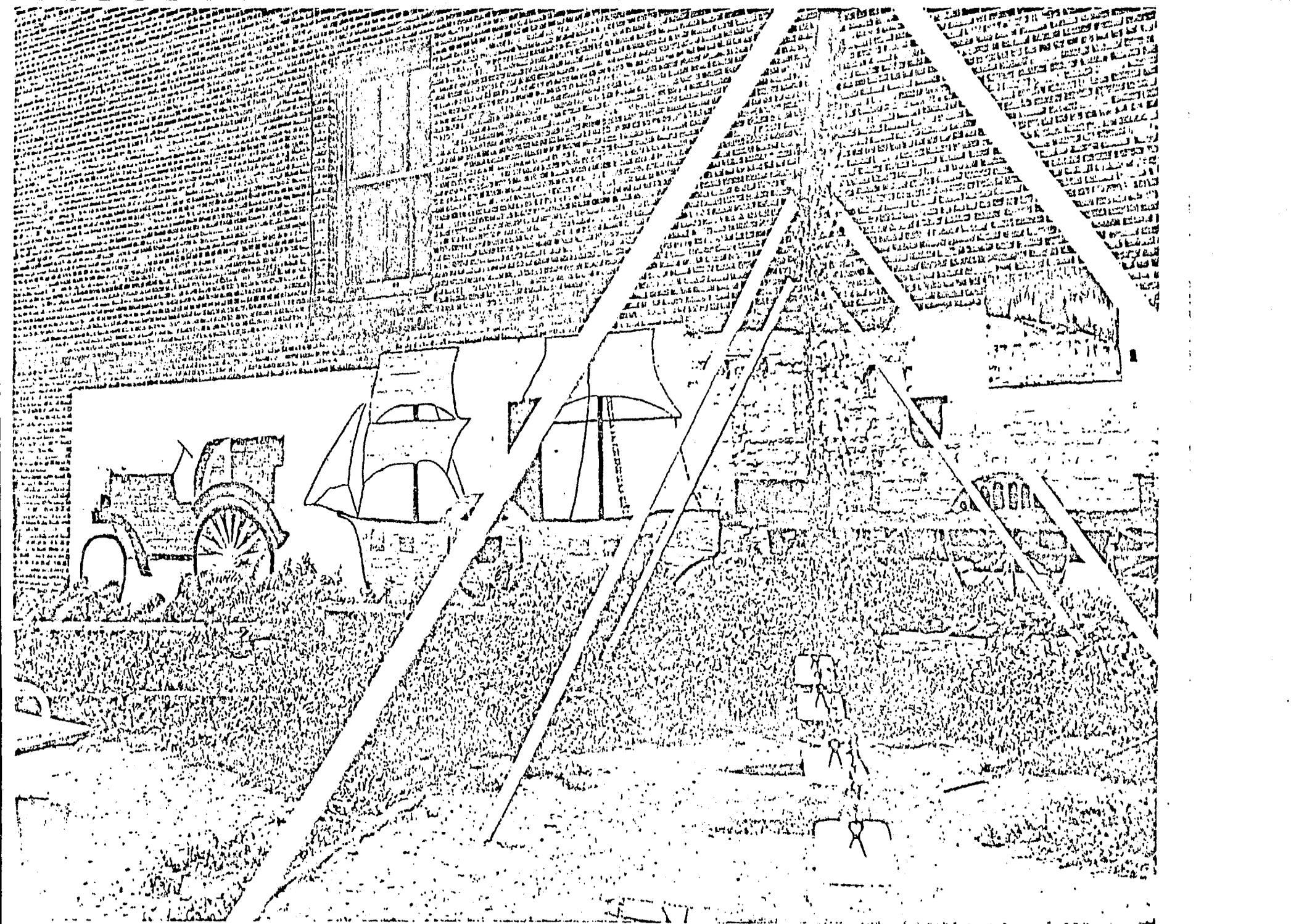




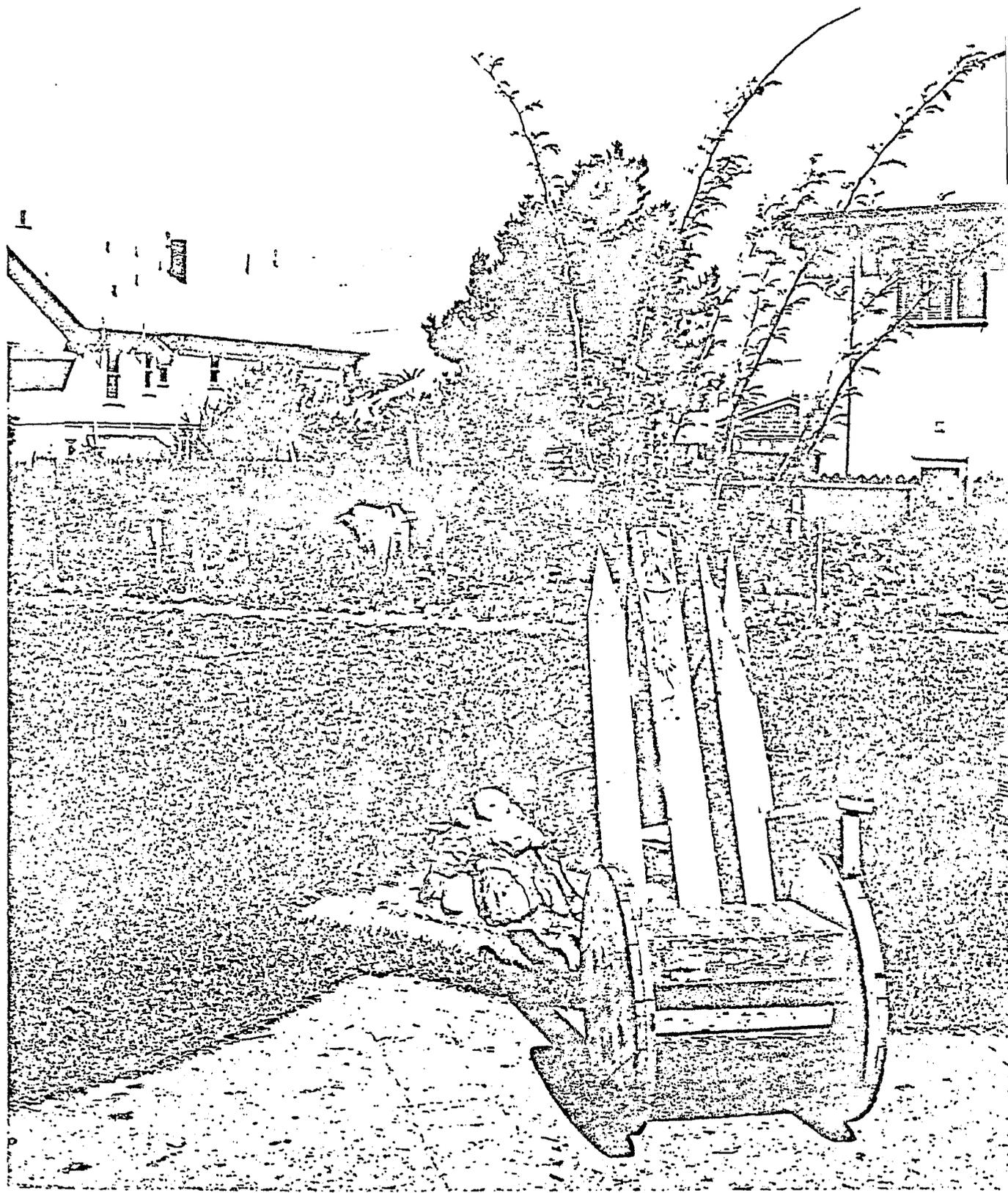














References

- Walter Blum, "Greening the School Yards." California Living Magazine, March 16 1975, pp. 7-10.
- Timothy D. Crowe, E. J. Pesce, A. Riemer, and L. F. Hanes, Crime Prevention Through Environmental Design, School Demonstration Plan, Broward County, Florida. Arlington, Va.: Westinghouse Electric Corporation, March 1976.
- Jane Jacobs, Death and Life of Great American Cities. New York: Random House, 1969.
- Charles A. Lewis, "Public Housing Gardens--Landscape for the Soul." Landscape for Living, U.S.D.A. Yearbook of Agriculture, 1972, pp. 277-282.
- Charles A. Lewis, "People-Plant Interaction: A New Horticultural Perspective." American Horticulturalist, 1973, 52, pp. 18-25.
- Charles A. Lewis, American Horticultural Society--People-Plant Program. Paper presented at U.S. Forest Service Symposium on "Child, Nature, and the Urban Environment," May, 1975.
- Charles A. Lewis, "People-Plant Interaction: A Man-Environment Relationship," University of Washington Arboretum Bulletin, 1976, 39, 2-10.
- M. Lincourt and H. Parness, Metro/Education. Montreal: University of Montreal, 1970.
- Oscar Newman, Defensible Space. New York: Macmillan, 1972.
- Jerry Romotsky and Sally R. Romotsky, Los Angeles Barrio Calligraphy. Los Angeles: Dawson Book Shop, 1976.
- Robert Sommer, Street Art. New York, Links, 1975.

Sunset Editors, "Street Art Explosion in Los Angeles," Sunset, April, 1973, pp. 110-112.

Roger M. Williams, "Why Children Should Draw." Saturday Review, September 3, 1977, pp. 10-16.

J. W. Thomas and R. A. Dixon, "Cemetery Ecology." Natural History, March, 1973, pp. 61-67.

J. M. Tien, T. A. Reppetto, and L. F. Hanes, Elements of CPTED, Arlington, Va.: Westinghouse Electric Corporation, May 1976, p. 25.

Jeane Westin, "A Novel Way to Stop Vandals." Parade, Jan. 20, 1974, pp. 10-12.

J. V. Young, "Pop Art Gets the Upper Hand at California Park." New York Times, June 4, 1967.

J. B. Williams, "the Big Picture is Just the Beginning"
the Detroitter, June 1973, pp. 25-26.

MUNICIPAL CRIME RATES AND LAND USE PATTERNS

*George Sternlieb**
*Robert W. Burchell***
*Stephen Casey****

*Director
**Research Professor
***Assistant Professor

Rutgers University
Center for Urban Policy Research
2 January 1978

Prepared for:

PUBLIC APPLIED SYSTEMS
A DIVISION OF WESTINGHOUSE
ELECTRIC CORPORATION



INTRODUCTION - CRIME AND LAND USE

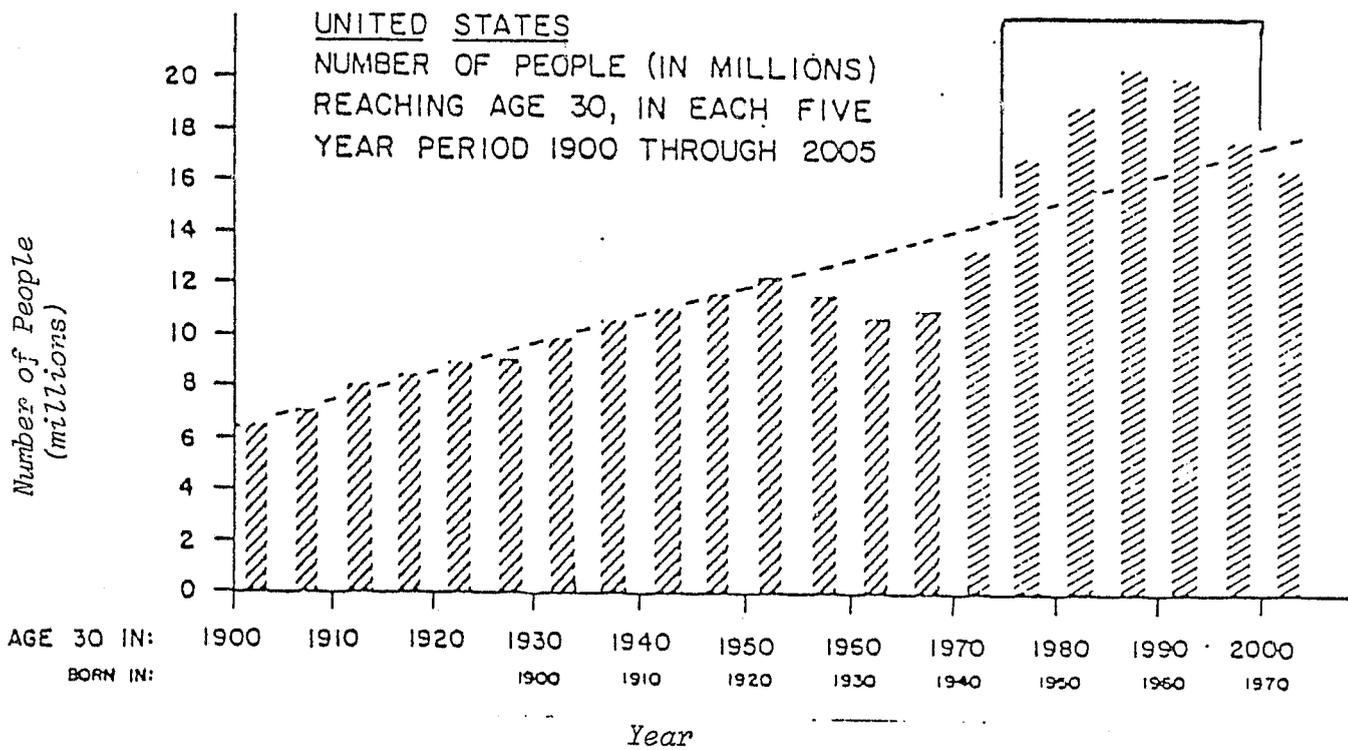
The literature on the factors affecting crime incidence is both voluminous and growing with great rapidity. As indicated in the bibliography to this report, variables such as race, social status, family status, drug usage, neighborhood environment, climate (season or temperature), time (hour or day of week), population size and density to name just a few, have been considered. Despite the profusion of analysis and efforts to seek correlates of crime, in order to both understand the phenomenon and hopefully to reduce its incidence, it is most striking to note the paucity of literature specific to crime variations as a function of land use. This is evident both in absolute analysis and in dynamic approaches, i.e., land use at a moment of time versus changes in land use over time. The few efforts have largely been confined to micro-analysis at the census tract or block level within a particular city.¹

The profound level of change in land use which is occurring as a function of an enormous increase in the proportion of the population at household initiation levels is evident (Exhibit 1). It is accentuated by changes in household size, coupled by significant shifts in population, both regional and increasingly exurban, as well as its corollaries: industrial and commercial development. The

¹See for instance: Christopher S. Dunn "Patterns of Robbery Characteristics and Their Occurrence Among Social Areas" (Albany, New York, Criminal Justice Research Center, 1976).

EXHIBIT 1

POPULATION GROWTH OCCASIONING HOUSING DEMAND -1980-2000



Source: Public Systems Evaluation Inc. "Stabilizing Neighborhoods: A Fresh Approach to Housing Dynamics and Perceptions" (Cambridge, Mass. PSE Inc. Nov. 1977), p. 71 (unpublished).

3

boom currently in one family starts has been lagged by apartment construction levels, but the latter is beginning to accelerate. The importance of securing better hand-holds on the linkages between land use and crime in order to ensure an appropriate environment for all Americans is all too clear. Much of the argument which revolves around rental housing facilities versus homeownership in the suburbs; the impact of commercial facilities in terms of a full systems approach to their role within a community and the like, are taking place in a vacuum of data.

In yet another sector of public interest, are the variables which should be associated with the various forms of revenue sharing. In general, the formulas that have been used have assumed that growth in income per capita as well as overall growth in a community, are signals of significant import to the specific community's receipts from inter-governmental transfers.² Unmeasured in this context have been the results of such primary development on the realities of crime, the requirements and expenditures to inhibit it, and future planning implications, both in growth and no-growth areas.

NEW JERSEY AS THE DATA BASE FOR THIS STUDY

The study which follows takes advantage of a practically unique data base which exists in the state of New Jersey. Foremost among its attributes are the very substantial number of communities in a physically small state.

² See: Final Data Elements, Entitlement Period 9 (Department of the Treasury, Office of Revenue Sharing, October, 1977).

Data is available, for example, as will be noted in more detail later, for close to 600 political subdivisions. And all of this within a 20,000 squaremile entity. Included within the data base are substantial measures of standardized, detailed land use and developmental patterns. The cooperation of the New Jersey State Police was available in a most generous fashion in making available updated and corrected crime data for each of the several municipalities detailed later. We are also deeply appreciative of the cooperation of the State Police authorities in clarifying some of the ambiguities and changes in classification and definition which abound in this very complex area, particularly in the crime incidence elements analyzed over time.³ Exhibit 2 summarizes the data base which has been developed for this study and which is utilized in the statistical analysis which follows. A full description of the variables is in Appendix B.

CRIME AND LAND USE

Statistical Design

A single size category of cities--10,000 to 20,000 is chosen for analysis. Isolation of this population category reflects an attempt to minimize the variation in crime and land use by city size which has been reported on previously, and to focus on mid-size municipalities with sufficient case representation to draw statistical inferences.

Within this set of cities two questions will be asked.

First, do the absolute crime rates and the absolute level

³For definitions of the Crime Index and inclusive offenses refer to "Common Crime Terms" in Appendix A at the end of this report.

of component index offenses differ significantly in municipalities of high and low concentrations of real property valuation per capita? Second, do the changes in crime rates and changes in levels of component index offenses differ significantly in municipalities which undergo, over time, high and low changes in real property valuation per capita?

Locations of high and low real property valuation per capita are defined as municipalities which, in 1975, were in the top or bottom one-third, respectively, in real property valuation per capita of the approximately 110 municipalities which comprise this population set. Locations of high and low real property valuation change per capita are also dichotomous groups of communities in this single population range which demonstrate respectively, the highest and lowest changes in real property valuation per capita over the period 1970 to 1975. Per capita property valuation in 1975 and changes over the period 1970 to 1975 are represented by four categories of municipal land use; single family, apartment, commercial and industrial development.

The statistical procedure chosen is the *difference of means* between averages of crime rates, and index offenses of the grouped cities. The significance threshold employed to demonstrate statistical linkage is t (2 tail probability) $\leq .05$. If F (2 tail probability is $\geq .05$ pooled variance will be examined; $\leq .05$, separate variance.

Statistical Linkages

Single Family Development

Exhibit 3A and 3B show crime rates and index offense averages for communities of high and low valuation and high and low changes in valuation respectively. In Exhibit 9A it is evident that significant differences do exist in the 1975 crime rates and all index offenses (except murder) in New Jersey municipalities which demonstrate low versus high per capita single family real property valuation. Cities which exhibit either a greater concentration of single family development than others or a higher value of single family development for similar concentrations have a lower total crime rate as well as lower violent and nonviolent crime rates. The same direction of relationship is true for all inclusive index offenses except murder which shows a similar direction of relationship but is not statistically significant.

As indicated by Exhibit 3B there are no significant linkages between changes in single family valuation per capita (concentration or wealth) and changes in either crime rates or individual crime index offenses.

Apartment Development

For apartment development the interesting linkage with crime is not 1975 incidence and 1975 land use concentrations (Exhibit 4A), but rather in changes in these variables over time. Exhibit 4B shows statistically

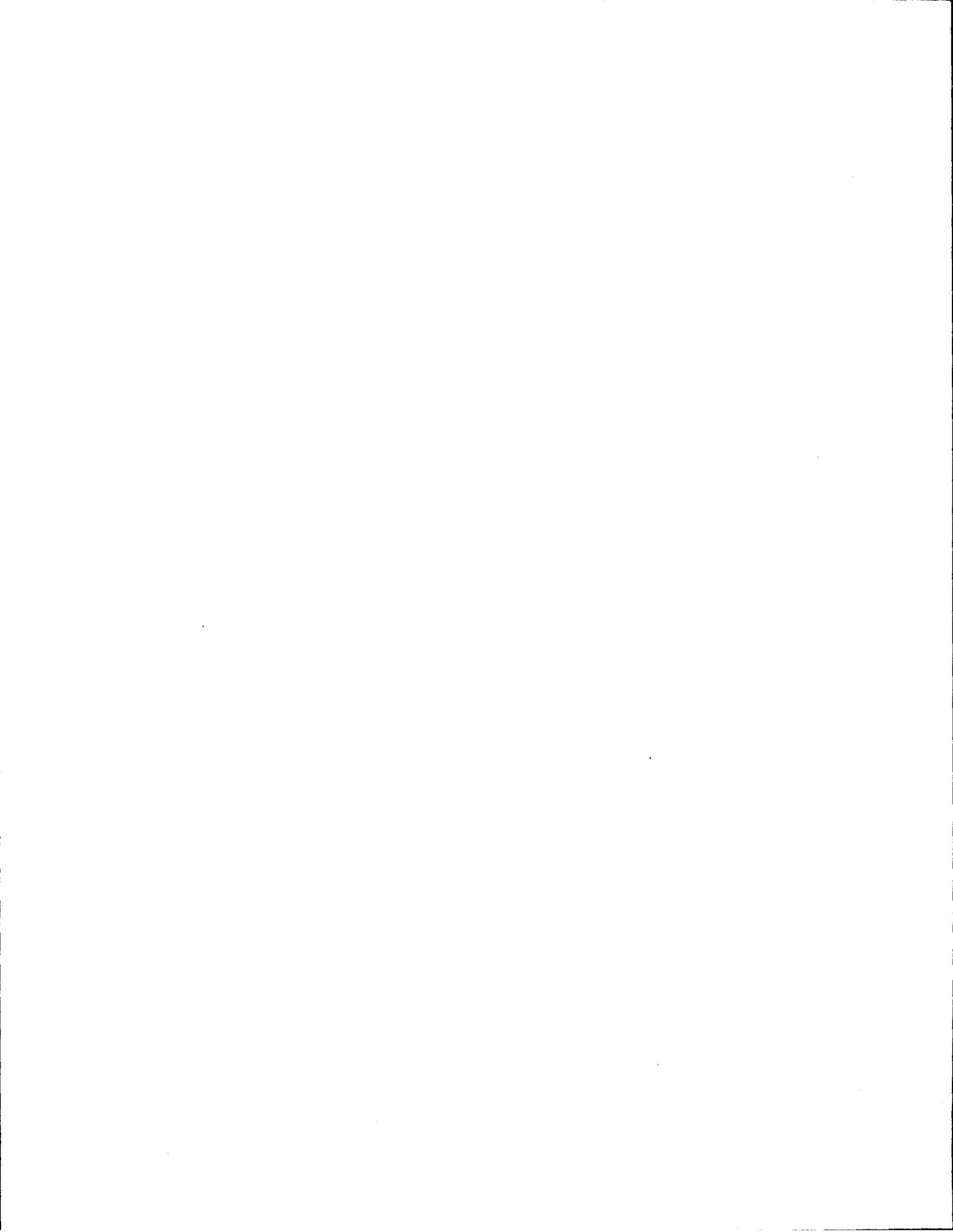


EXHIBIT 3A

1975 CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000 - 20,000 POPULATION
IN COMMUNITIES OF HIGH AND LOW SINGLE FAMILY REAL PROPERTY VALUATION PER
CAPITA IN 1975

Static Crime Variable	Property Valuation Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degree of Freedom	Significance Level (2 Tail Prob.)
Total Crime Rate	Low Valuation	35	45.86	2.55	.916	Pooled	3.05	70	.003
	High Valuation	37	35.10	2.44					
Violent Crime Rate	Low Valuation	35	2.01	.20	.000	Separate	5.30	46.86	.000
	High Valuation	37	.86	.09					
Nonviolent Crime Rate	Low Valuation	35	43.85	2.47	.966	Pooled	2.79	70	.007
	High Valuation	37	34.25	2.39					
Forcible Rape	Low Valuation	35	.14	.02	.006	Separate	2.55	56.20	.014
	High Valuation	37	.07	.01					
Robbery	Low Valuation	35	.93	.11	.000	Separate	5.77	37.80	.000
	High Valuation	37	.25	.03					
Atrocious Assault	Low Valuation	35	.90	.11	.021	Separate	2.98	59.14	.004
	High Valuation	37	.53	.07					
Breaking and Entering	Low Valuation	35	13.13	1.05	.347	Pooled	1.87	70	.050
	High Valuation	37	10.58	.87					
Larceny	Low Valuation	35	26.84	1.71	.929	Pooled	2.07	70	.042
	High Valuation	37	21.94	1.64					
Motor Vehicle Theft	Low Valuation	35	3.62	.36	.000	Separate	4.85	50.03	.000
	High Valuation	37	1.68	.18					

Note: Index offense of murder is not significant at .05 level.

EXHIBIT 3B

1970-1975 CHANGE IN CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000-20,000
POPULATION IN COMMUNITIES OF HIGH AND LOW SINGLE FAMILY REAL PROPERTY
VALUATION CHANGE PER CAPITA 1970-1975

Dynamic Crime Variable	Property Valuation Change Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degree of Freedom	Significance Level (2 Tail Prob.)
------------------------	------------------------------------	-----------------	------	----------------	---------	-------------------	---------	-------------------	-----------------------------------

None Significant

None Significant

Note: Change in total crime rate, violent crime rate, nonviolent crime rate and change in index offenses of murder, forcible rape, robbery, atrocious assault, breaking and entering, larceny, and motor vehicle theft are not significant at .05 level.

Source:

Uniform Crime Reports - State of New Jersey, (West Trenton, N.J., State of New Jersey, Division of State Police, 1975, 1970).

significant associations of growth in apartment real property valuation per capita and increases in crime - both total and nonviolent crime rates and several index offenses (murder, forcible rape, breaking and entering and larceny). Thus, as the local ratable base expands in apartment valuation per capita so too is there an expansion of local crime rates.

*Commercial Development*⁴

Existing commercial development in a community (Exhibit 5A) rather changes in a community's commercial development over time (Exhibit 5B)) seems to indicate the stronger relationship with differing levels of crime in communities. Locations of high concentration of business uses per capita evidence significantly more nonviolent crime per 1000 population than is the case for locations of lower business concentrations.

⁴Levels or changes in levels of industrial development evidenced no significant relationships with incidence or changes in incidence of crime. Results are not summarized in chart form.

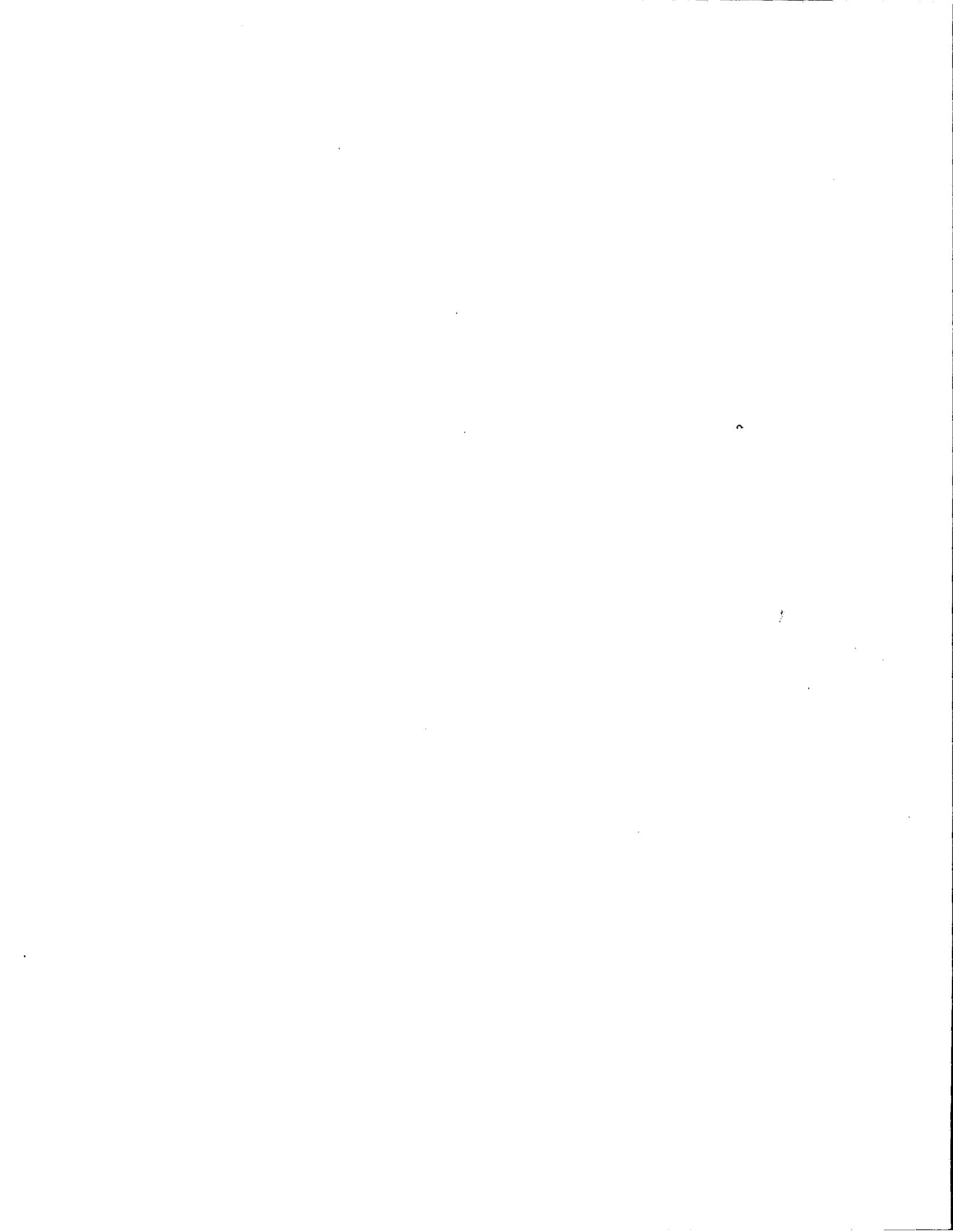


EXHIBIT 4A

1975 CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000-20,000 POPULATION IN COMMUNITIES OF HIGH AND LOW APARTMENT REAL PROPERTY VALUATION PER CAPITA IN 1975

Static Crime Variable	Property Valuation Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degrees of Freedom	Significance Level (2 Tail Prob.)
Murder	Low Valuation	36	.024	.008	.000	Separate	2.04	50.50	.047
	High Valuation	36	.007	.004					
Robbery	Low Valuation	36	.43	.10	.722	Pooled	-1.98	70	.049
	High Valuation	36	.69	.09					
Motor Vehicle Theft	Low Valuation	36	2.12	.23	.014	Separate	-2.24	60.37	.029
	High Valuation	36	3.08	.36					

Note: Total crime rate, violent crime rate, nonviolent crime rate and index offenses of forcible rape, atrocious assault, breaking and entering and larceny are not significant at .05 level.

EXHIBIT 4B

1970-1975 CHANGE IN CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000-20,000 POPULATION IN COMMUNITIES OF HIGH AND LOW APARTMENT REAL PROPERTY VALUATION CHANGE PER CAPITA 1970-1975

Dynamic Crime Variable	Property Valuation Change Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degrees of Freedom	Significance Level (2 Tail Prob.)
Total Crime Rate	Low Valuation	23	9.7	1.8	.000	Separate	-2.87	53.54	.006
	High Valuation	38	21.1	3.5					
Nonviolent Crime Rate	Low Valuation	23	9.8	1.9	.000	Separate	-2.82	53.81	.007
	High Valuation	38	21.4	3.6					
Murder	Low Valuation	23	0.0	0.0	.000	Separate	1.90	37.00	.050
	High Valuation	38	-2.3	1.2					
Forcible Rape	Low Valuation	23	0.2	3.1	.003	Separate	-1.95	58.37	.049
	High Valuation	38	11.0	4.5					
Breaking and Entering Larceny	Low Valuation	23	12.9	2.8	.045	Separate	2.04	58.42	.046
	High Valuation	38	21.8	3.3					
Larceny	Low Valuation	23	11.4	2.5	.000	Separate	-2.35	46.20	.023
	High Valuation	38	28.6	6.8					

Note: Change in violent crime rate and change in index offenses of robbery atrocious assault, and motor vehicle theft not significant at .05 level.

Source: Uniform Crime Reports - State of New Jersey (West Trenton, N.J., State of New Jersey, Division of State Police, 1975, 1970).

EXHIBIT 5A

1975 CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000-20,000 POPULATION IN COMMUNITIES OF HIGH AND LOW COMMERCIAL REAL PROPERTY VALUATION PER CAPITA IN 1975

Static Crime Variable	Property Valuation Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degrees of Freedom	Significance Level (2 Tail Test)
Total Crime Rate	Low Valuation	35	31.87	1.81	.056	Pooled	-4.55	70	.000
	High Valuation	37	45.86	2.45					
Nonviolent Crime Rate	Low Valuation	35	30.68	1.74	.046	Separate	-4.70	64.96	.000
	High Valuation	37	44.56	2.38					
Robbery	Low Valuation	35	.40	.07	.185	Pooled	-1.95	70	.050
	High Valuation	37	.61	.08					
Breaking and Entering	Low Valuation	35	9.21	.76	.346	Pooled	-2.90	70	.005
	High Valuation	37	12.56	.87					
Larceny	Low Valuation	35	19.60	1.14	.007	Separate	-4.42	60.94	.000
	High Valuation	37	28.89	1.77					
Motor Vehicle Theft	Low Valuation	35	1.77	.20	.022	Separate	-3.60	63.35	.001
	High Valuation	37	3.00	.28					

Note: Violent crime rate and index offenses of murder, forcible rape, and atrocious assault are not significant at the .05 level.

EXHIBIT 5B

1970-1975 CHANGE IN CRIME RATES OF NEW JERSEY COMMUNITIES OF 10,000-20,000 POPULATION IN COMMUNITIES OF HIGH AND LOW COMMERCIAL REAL PROPERTY VALUATION CHANGE PER CAPITA (1970-1975)

Dynamic Crime Variable	Property Valuation Change Grouping	Number of Cases	Mean	Standard Error	F Value	Variance Estimate	t Value	Degrees of Freedom	Significance Level (2 Tail Test)
------------------------	------------------------------------	-----------------	------	----------------	---------	-------------------	---------	--------------------	----------------------------------

None Significant

None Significant

Note: Change in total crime rate, violent crime rate, nonviolent crime rate and change in index offenses of murder, forcible rape, robbery, atrocious assault, breaking and entering, larceny, and motor vehicle theft are not significant at .05 level.

Source: Uniform Crime Reports - State of New Jersey (West Trenton, N.J., State of New Jersey, Division of State Police, 1975, 1970).



SUMMARY - FUTURE DIRECTIONS FOR RESEARCH

The results reported here, in preliminary fashion, indicate that for New Jersey communities of the 10,000 to 20,000 population range, generally lower crime rates are found in areas of high single family development concentration, areas which have lower proportions of business use, and those whose development, over time is not characterized by apartment growth.

The procedures employed here are relatively simple two way statistical tests and do not delve deeply into the inner socio-economic fabric of cities characterized by different land uses. The application of more sophisticated statistical tests to a wider range of variables is a ripe area for future analyses, both at Rutgers and elsewhere.⁵

⁵ See for instance A. Paul Tribble and Charles F. Smith, "Crime in El Paso County, Colorado, A Spatial Perspective" (Denver, Col. U.S. Air Force Academy, 1977); M.H. Bremner, "Economic Change and Social Pathologies in Urban Areas" (Baltimore, Md. Johns Hopkins University, 1977); W.G. Skogan "Citizen Evaluation of Crime and Criminal Justice-Variations Within and Across Large American Cities" (Evanston, Ill. Northwestern University, 1977).

COMMON CRIME TERMS

- Crime Index* - Crime Index offenses referred to here represent the most common problems to law enforcement and the municipality. They are serious crimes by their nature, volume or frequency of occurrence. Basically, they can be categorized as violent crimes, such as murder, forcible rape, robbery and atrocious assault, or as crimes of a non-violent nature, such as breaking and entering, larceny and motor vehicle theft.
- Crime Rate* - Crime rates relate the incidence of crime to population. As used here - per 1000 population.
- Violent Crime Rate* - Incidents of murder, forcible rape, robbery and atrocious assault expressed per 1000 population.
- Nonviolent Crime Rate* - Incidents of breaking and entering, larceny and motor vehicle theft expressed per 1000 population.
- Murder* - Murder is defined as the unlawful killing of a human being with malice aforethought. Any death due to a fight, argument, quarrel, assault or commission of a crime is included.
- Forcible Rape* - Forcible rape is defined as the carnal knowledge of a female forcibly and against her will. All assaults and attempts to rape are counted, but carnal abuse, rape without force (statutory rape) and other sex offenses are not included.
- Robbery* - Robbery is defined as the felonious and forcible taking of the property of another, against his will, by violence or by putting him in fear. The element of personal confrontation is always present in this crime. Under this definition assaults or attempts to rob are included.
- Atrocious Assault* - Atrocious assault is an attempt or offer, with unlawful force or violence, to do serious physical injury to another.
- Breaking and Entering* - Breaking and entering is defined as an unlawful entry or attempted forcible entry of any structure to commit a felony or larceny.

Larceny - The definition of larceny-theft, as defined herein, is the taking of the property of another with intent to deprive him of ownership. All larcenies and thefts resulting from pocket-picking, purse-snatching, shoplifting, larcenies from motor vehicles, thefts of motor vehicle parts and accessories, bicycle thefts, etc., are included.

*Motor
Vehicle
Theft*

- Motor Vehicle theft includes all thefts and attempted thefts of a motor vehicle. This includes all vehicles which can be registered as a motor vehicle in this state. This definition excludes taking a motor vehicle for temporary use, such as a family situation, or unauthorized use by others having lawful access to the vehicle.

Source: Uniform Crime Reports - State of New Jersey (West Trenton, N.J., State of New Jersey, Division of State Police, 1975).

APPENDIX B

DISCUSSION OF THE VARIABLES

Cards 1 and 2 detail municipal crime statistics for 1975 and 1970, respectively, as well as total police and civilian employees, of the respective communities. Information is thus provided for 21 counties and 563 municipalities (Note: four of the state's total of 567 municipalities were eliminated from the study because of insufficient data -- they had less than 200 persons in residence and were essentially tax havens, i.e., municipalities of convenience rather than true entities.)

Cards 3 and 4 provide primary municipal, financial and land use characteristics for the years 1975 and 1970. A variety of variables of importance have been secured, with an effort to view their statistical linkage, if any.

A word of definition is in order here. The *state equalized tax rate* provides, for each of the municipalities, tax rates adjusted for the assessment ratio, i.e., a true tax rate which is comparable from community to community. As is not uncommon throughout the United States, separate taxing activity for school purposes versus other municipal activity as well as the county override, requires individual tax computations.¹ These have been grouped under the state equalized tax rate rubric. Thus it is the true real property tax rate for each of the specific communities.

¹ See Robert W. Burchell and David Listokin. The Fiscal Impact Handbook (New Brunswick, N.J. Rutgers University, Center for Urban Policy Research, 1978).

EXHIBIT 2

DATA SETS USED IN THE CRIME/LAND USE ANALYSIS

CARD #1 - MUNICIPAL CRIME STATISTICS - 1975

<u>Columns</u>	<u>Variable</u>
1- 5	Crime Index - Total
6-10	Total Crime Rate Per 100,000 Population
11-15	Violent Crime Rate Per 10,000 Population
16-20	Nonviolent Crime Rate Per 100,000 Population
21-25	Murder (Reported Number of Incidents Per Year)
26-30	Forcible Rape (" " " " ")
31-35	Robbery (" " " " ")
36-40	Atrocious Assault (" " " " ")
41-45	Breaking and Entering (" " " " ")
46-50	Larceny (" " " " ")
51-55	Motor Vehicle Theft (" " " " ")
56-60	Total Police Employees
61-65	Civilian Employees
75-76	County Code
77-79	Municipality Code
80	Card Number

CARD # 3 - MUNICIPAL FINANCIAL AND LAND USE CHARACTERISTICS 1975

<u>Columns</u>	<u>Variable</u>
1- 5	State Equalized Total (Municipal, School, County) Tax Rate (Dollars Per \$100 Equalized Valuation)
6-10	State Equalized Municipal Tax Rate (Dollars Per \$100 Equalized Valuation)
11-20	State Equalized Total Property Valuation (\$)
21-30	Annual Municipal Expenditures - Police (\$)
31-40	Annual Municipal Expenditures - All Functions (\$)
41-45	State & Federal Aid Received - (Thousands of \$)
46-50	Total Number of Land Parcels Within Municipality

CARD #2 - MUNICIPAL CRIME STATISTICS - 1970

<u>Columns</u>	<u>Variable</u>
1- 5	Crime Index - Total
6-10	Total Crime Rate Per 100,000 Population (Not reported)
11-15	Violent Crime Rate Per 10,000 Population (Must be calculated using Columns 21-55 & 66-71)
16-20	Nonviolent Crime Rate Per 100,000 Population (using Columns 21-55 & 66-71)
21-25	Murder (Reported Number of Incidents Per Year)
26-30	Forcible Rape (" " " " ")
31-35	Robbery (" " " " ")
36-40	Atrocious Assault (" " " " ")
41-45	Breaking & Entering (" " " " ")
46-50	Larceny (" " " " ")
51-55	Motor Vehicle Theft (" " " " ")
56-60	Total Police Employees
61-65	Civilian Employees
66-71	1970 Municipal Population
75-76	County Code
77-79	Municipality Code
80	Card Number

CARD # 4 - MUNICIPAL FINANCIAL AND LAND USE CHARACTERISTICS 1970

<u>Columns</u>	<u>Variable</u>
1- 5	State Equalized Total (Municipal, School, County) Tax Rate (Dollars Per \$100 Equalized Valuation)
6-10	State Equalized Municipal Tax Rate (Dollars Per \$100 Equalized Valuation)
11-20	State Equalized Total Property Valuation (\$)
21-30	Annual Municipal Expenditures - Police (\$)
31-40	Annual Municipal Expenditures - All Functions (\$)
41-45	State and Personal Aid Received - (Thousands of \$)
46-50	Total Number of Land Parcels Within Municipality

(continued)

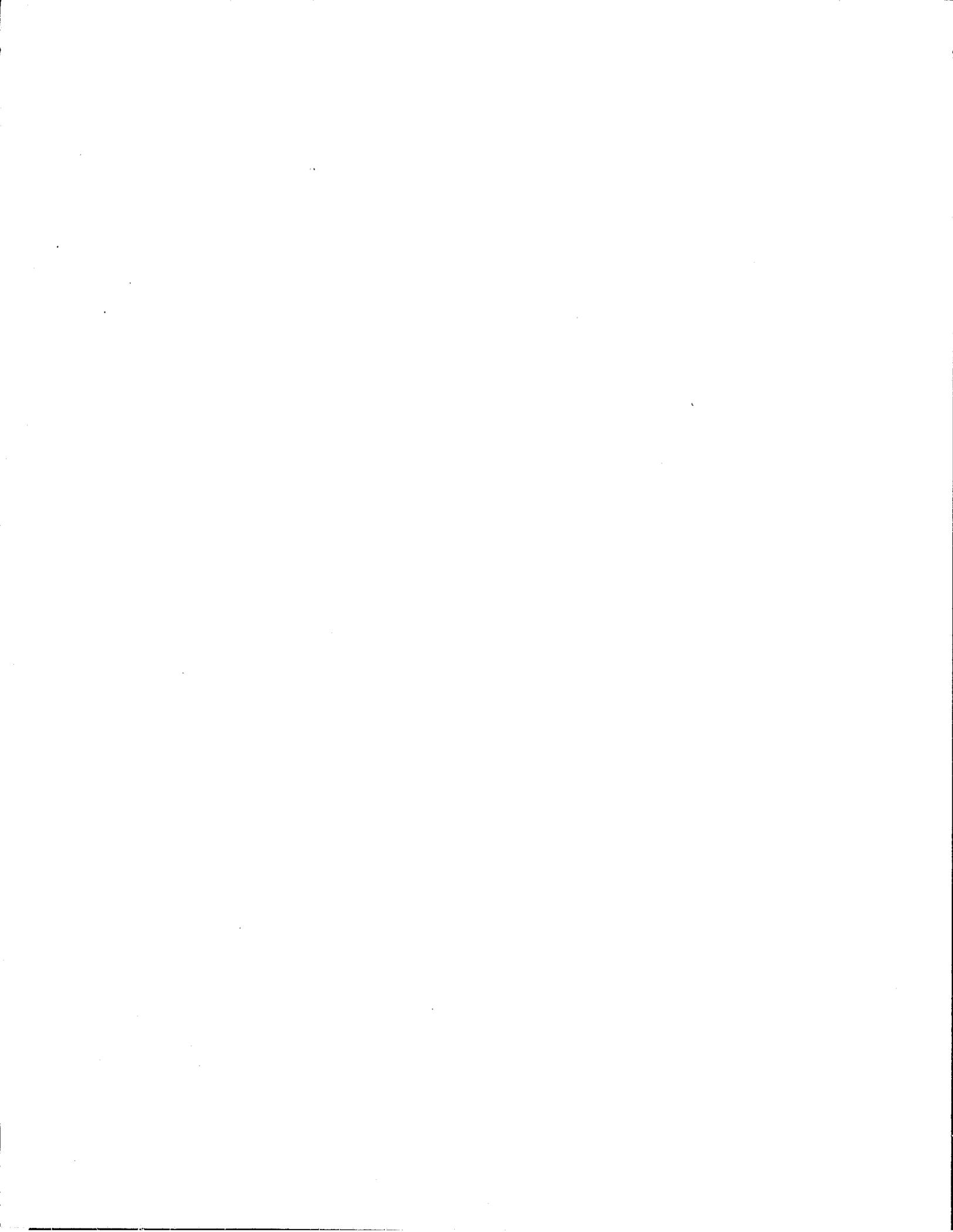
EXHIBIT 2

DATA SETS USED IN THE CRIME/LAND USE ANALYSIS (continued)

51-52	% of Land Vacant (As a proportion of total local property valuation)	51-52	% of Land Vacant (As a proportion of total local property valuation)
53-54	% of Land Residential (As a proportion of total local property valuation)	53-54	% of Land Residential (As a proportion of total local property valuation)
55-56	% of Land Farm (As a proportion of total local property valuation)	55-56	% of Land Farm (As a proportion of total local property valuation)
57-58	% of Land Commercial (As a proportion of total local property valuation)	57-58	% of Land Commercial (As a proportion of total local property valuation)
59-60	% of Land Industrial (As a proportion of total local property valuation)	59-60	% of Land Industrial (As a proportion of total local property valuation)
61-62	% of Land Apartments (As a proportion of total local property valuation)	61-62	% of Land Apartments (As a proportion of total local property valuation)
63-64	% of Land Vacant (As a proportion of total number of parcels)	63-64	% of Land Vacant (As a proportion of total number of parcels)
65-66	% of Land Residential (As a proportion of total number of parcels)	65-66	% of Land Residential (As a proportion of total number of parcels)
67-68	% of Land Farm (As a proportion of total number of parcels)	67-68	% of Land Farm (As a proportion of total number of parcels)
69-70	% of Land Comm. (As a proportion of total number of parcels)	69-70	% of Land Comm. (As a proportion of total number of parcels)
71-72	% of Land Industrial (As a proportion of total number of parcels)	71-72	% of Land Industrial (As a proportion of total number of parcels)
73-74	% of Land Apartments (As a proportion of total number of parcels)	73-74	% of Land Apartments (As a proportion of total number of parcels)
75-76	County Code	75-76	County Code
77-79	Municipality Code	77-79	Municipality Code
80	Card Number	80	Card Number

Source(s): Cards (1) & (2) Uniform Crime Reports - State of New Jersey (West Trenton, N.J. State of New Jersey Division of State Police, 1975, 1970).

Cards (3) & (4) Report of the Division of Local Government Services (Trenton, N.J. State of New Jersey, Department of Community Affairs, 1975, 1970).



The *state equalized municipal tax rate* refers only to a subset of the previous variable, incorporating as it does, solely taxes raised for municipal, i.e., non-education, non-county, purposes. It is a rough measure of the level of tax incidence required to maintain municipal services other than education.

For each of the several communities, the *state equalized total property valuation* provides a measure of the real value of property within the community. It should be noted in this context that New Jersey is practically unique within the United States in that this figure is based upon a 100 percent analysis of all transactions on a sales to assessment ratio.² Thus, the data is annually reevaluated for each community.

The *annual municipal expenditures: police* is the actual dollar expenditures for police operations. It does not include debt service. It therefore provides a rough measure of the community's on-line, operational expenditures for police protection. There is some slight variation between this figure, which is the reality of expenditure, versus the nominal, budgeted figure. Discussion with police authorities have led us to prefer the actual rather than the projected figure.

² Thirty-Eighth Annual Report of the Division of Local Government Services - 1975. (Trenton, N.J. State of New Jersey, Department of Community Affairs, November 1976).

The *annual municipal expenditures: all functions* includes debt service. It is the total municipal expenditures of the specific community; again this has been developed for all of the 563 communities to be analyzed. The figure is important in and of itself, particularly when the ratio between police and all-function expenditures are analyzed by size of municipality. In the past annual municipal expenditures could be viewed as roughly equivalent to the equalized tax rate times the equalized total property value.

As the variety both of taxing mechanisms and inter-governmental transfers have risen, however, this is no longer the case. Particularly striking in this regard is the next variable.

State and federal aid received is the sum of all transfer payments received by each of the several municipalities. There is substantial variation over time in the scale of transfer payments on a per capita basis. This is particularly the case, given the evolving sophistication of the federal revenue sharing formulae as well as New Jersey's specific Urban Aid formulas, both have increasingly been earmarked to those communities which have a variety of measurable social blight, with unemployment very heavily weighted in both sets. (State aid is particularly impacted, as well, by the level of welfare dependency). Within any one size group, therefore, the variance in the state and federal aid received is a rough analog of society's view of the local human problem.³

The bulk of the remaining variables to be considered in this section refer specifically to land utilization in its various forms. The first of these is the *total number of land parcels within the municipality*. This provides the denominator figure as a very rough input into total land disposition and balance within the several municipalities which are to be considered.

³ See: Advisory Commission on Intergovernmental Relations. Significant Features of Fiscal Federalism - 1975-1976 Edition, (Washington, D.C. U.S. Government Printing Office, 1977).

The next set of variables use the *total local property evaluation* as the denominator while the numerators are specific to a variety of developmental characteristics. For example, in order to determine the percentage of land vacant, by the definition utilized in this section, the variable would be the value of such vacant land as a proportion of total local property value. This is followed by equivalent procedures for *residential* land, *farm* land, *commercial* land, *industrial* land, and land developed in *apartments*. It should be noted in this context that the term *residential* land refers to properties developed at the 1, 2 or 3 dwelling unit levels, while *apartment* land as utilized here, is for 4 dwelling units or more.⁴

Land allocation as a percentage of total parcels

As a check on the ratios developed above, an equivalent procedure is then undertaken which produces a series of independent variables incorporating the proportionate number of parcels in various forms of utilization to the total parcels of land within each of the several communities. For example, the procedure used for vacant parcels to total involves the determination of the number of parcels of land *vacant*, as a proportion of total land parcels within the community. The same procedure is used for *residential*, *farm*, *commercial*, *industrial*, and *apartments*.

⁴ For definitions see William I. Goodman and Eric C. Freund Principles and Practices of Urban Planning, (Washington, D.C. International City Managers Association, 1968).

The balance of the card is devoted to a county code, for each of the 21 counties and a municipality code for each of the 563 municipalities.

It should be noted that wherever possible, data over time has been incorporated (for 1970-1975 or approximations thereof). The analysis which follows is in part static, -- as of a moment in time, 1975, what are the relationships between the land use and crime variables? -- And in part dynamic -- over time, what are the linkages between changes in crime and changes in local land use?

ORDER OF PRESENTATION

The sequence of presentation which follows will focus in order:

1. Crime incidence in New Jersey by city size. The issue of crime statistics, their adequacy of reporting, the level of error in publication, is one which has attracted considerable controversy. The one major generalization however on crime incidence which is generally agreed on is the existence of rather distinct incidence variation as a function of community size;⁵ thus a partitioning of cities by size cohort will be a primary procedure to be followed in this first step.

2. Selecting a size cohort of communities with dynamic aspects for further analysis. In order to simplify the study, within the limitations of resources available, it is essential

⁵See: R.M. Haynes "Crime Rates and City Size in America" Area 5(3), 1973, 162-165.

that we focus on clusters of communities of equivalent size and, hopefully those in which there is a significant variance in developmental patterns, to strengthen the level of measurable association, if any. The approach utilized will be defined, the specifications of the subset clarified for further data manipulation.

3. Partitioning will take place based upon differing levels of land use distribution in 1975 and change in this distribution over the period 1970-75. Within the subsets of communities by size, appropriate statistical tests of significance will be utilized in determining these subset second level partitions. Differences in aggregate statistics as well as changes over time for each of the cells as indicated above will be detailed. Further, cells will be partitioned not merely in terms of total growth as a measure of total development, but rather according to the specifics of single family, multi-family, commercial and industrial growth.

4. Appropriate statistical tests of significance of association will then be applied. Within the limitations of the data size and scaling, wherever possible, the most rigorous available tests will be utilized. Thus the "t" test is employed to determine the significance of the difference of means in the various subset cells. A significance level of 0.05 or better is used as a measuring stick of significance of association.⁶ While this is a relatively

⁶ See: Norman Nie et al. Statistical Package for the Social Sciences (New York, McGraw Hill Book Publishing Company, 1975).

generous standard, it is appropriate for what at this level of venture must be viewed as an exploratory analysis. Exact significance levels are reported to provide insights for promising areas of future exploration.

CRIME RATES IN NEW JERSEY MUNICIPALITIES

There is substantial noise in the reporting of crime. This, as is indicated in the literature, has at least four dimensions:

1. By type of crime. There is some indication that at least historically the proportion of forcible rapes and of breaking and entering to actual incidence has been substantially under-reported. Murders, as well as motor vehicle thefts, on the other hand, are usually viewed as having a relatively fuller ratio of reporting to actual incidents.

2. By geographic location. Surveys undertaken by LEAA indicate very substantial variation in the actual crime incidence (as measured by resident survey) to reported levels between major cities. The level of under-reporting for example, in Newark was substantially lower than that reported in the City of Denver.⁷

3. By socioeconomic characteristic. There is some indications in the literature of variations in the level of reporting of crimes as a function of the socioeconomic characteristics of the victim.

⁷ Law Enforcement Administration Agency, Crime Reporting In American Cities (Washington, D.C. LEAA, 1976).

4. By reporting procedures. The intelligence/communication nexus may vary. The actual logging of crimes, reporting of them to intermediate data collection centers and ultimate publication, can vary between communities and possibly within regions.

The parameters outlined above, as well as many others, are not unique to crime reporting. The validity and comparability of measures of social incidents is imprecise at best. Though more publicized in the crime area, they do exist elsewhere (See for example, Sternlieb, The Sociology of Statistics).⁸ By confining this study to one state, and within that state, cities of comparable size, some of this variance hopefully will be dissipated. In any case, while the limitations of the data are acknowledged, these limitations do not excuse failure to integrate it within the state-of-the-art. This is the effort which will be pursued here.

Crime Rates by City Size

As shown in Exhibit A-1, there are substantial variations in 1975 crime rates per 1000 population as a function of city size. The data are presented for six different community-size partitions. The total number of municipalities considered is 563.

⁸ George Sternlieb. "The Sociology of Statistics: Measuring Substandard Housing" Review of Public Data Use, Vol. 1-3 July 1973. pp.1-6.

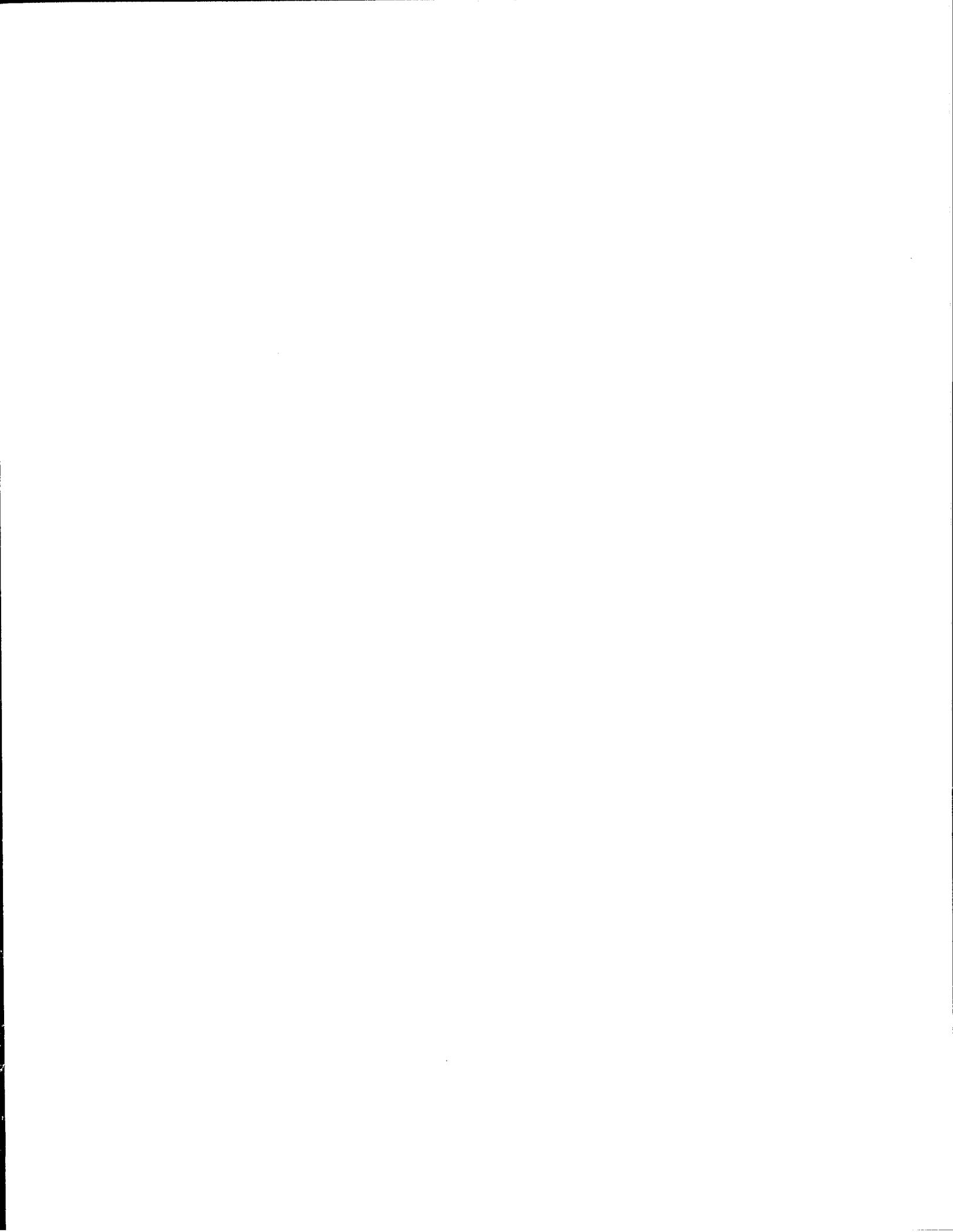


EXHIBIT A-1

ANNUAL CRIME RATE PER 1,000 POPULATION IN NEW JERSEY MUNICIPALITIES
BY CITY SIZE -- 1975 AGGREGATE OFFENSES

<i>City Size (1975)</i>	<i>1975 Total Crime Rate</i>	<i>1975 Violent Crime Rate</i>	<i>1975 Non-Violent Crime Rate</i>
200 - 1,000 (n=32)	39.67	1.38	38.29
1,001 - 2,500 (n=98)	40.22	1.74	38.48
2,501 - 10,000 (n=233)	39.78	1.57	38.21
10,001 - 20,000 (n=116)	41.19	1.52	39.67
20,001 - 60,000 (n=71)	49.04	2.80	46.24
Over 60,000 (n=13)	63.65	7.84	55.81
All Municipalities (n=563)	41.86	1.87	39.99
	c	= a	+ b

Source: Uniform Crime Reports - State of New Jersey
(West Trenton, N.J. State of New Jersey
Division of State Police, 1975).



CONTINUED

6 OF 7

The three size sets of communities under 10,000 are quite comparable in total crime rate. There is a slight increase in the 10,000-20,000 bracket, a much more substantial jump in the next group - 20,000-60,000, with an even more substantial increment in the over-60,000 population category.⁹ When this incidence, is further partitioned between violent crime rates and nonviolent crime rates, the pattern is roughly similar, subject to a slight but relatively insignificant variance in violent crime rates in the 10,000-20,000 level (this is actually lower than in two of the smaller size categories). In the largest size category, cities over 60,000, violent crimes are particularly pronounced, with an incidence rate nearly three times that of the next highest size category. The pattern is much more muted for nonviolent crimes, but considering their proportion of total, as would be expected, the pattern closely follows the earlier generalizations made.

The simple partitioning of crime incidence between violent and nonviolent elements tends to mute a variety of significant internal variations. These are shown in Exhibit A-2 again for 1975 by city size. As shown here, the largest single component of violent crime rates is atrocious assault, accounting for approximately a half to two-thirds of all violent crimes in smaller communities, up to the 20,000 population mark. For cities in excess of this size category, it is robberies which quickly take the lead. Indeed, in cities of over 60,000, the incidence of robberies amounts

⁹ The total crime rate for the state of New Jersey presented in Exhibits 38 is skewed, due to their representation, toward the crime rates of smaller cities. For the state as a whole, the total crime rate in 1975 was 50.59/1000.



EXHIBIT A-2

ANNUAL CRIME RATE PER 1,000 POPULATION FOR NEW JERSEY MUNICIPALITIES BY CITY SIZE -- 1975 INDEX OFFENSES

City Size (1975)	Total Crime Rate	Violent Crime Rate	Murder	Forcible Rape	Robbery	Atrocious Assault	Non-Violent Crime Rate	Breaking and Entering	Larceny	Motor Vehicle Theft			
200 - 1,000 (n=32)	39.67	1.38	.12	.09	.14	1.05	38.29	19.46	17.18	1.67			
1,001 - 2,500 (n=98)	40.22	1.74	.06	.26	.42	1.00	38.48	14.87	21.62	1.91			
2,501 - 10,000 (n=233)	39.78	1.57	.03	.14	.52	.88	38.21	12.73	23.10	2.11			
10,001 - 20,000 (n=116)	41.19	1.52	.02	.10	.67	.73	39.67	11.82	24.97	2.72			
20,001 - 60,000 (n=71)	49.04	2.80	.05	.13	1.40	1.22	46.24	13.56	28.26	4.31			
Over 60,000 (n=13)	63.65	7.84	.12	.30	4.58	2.83	55.81	18.99	27.06	9.70			
All Municipalities (n=563)	41.86	1.87	.04	.15	.71	.96	39.99	13.54	23.63	2.63			
	c	=	a				+	b					
		a	=	a ₁	+	a ₂	+	a ₃	+	a ₄			
							b	=	b ₁	+	b ₂	+	b ₃

Source: Uniform Crime Reports - State of New Jersey (West Trenton, N.J. State of New Jersey Division of State Police, 1975).

to one and a half times the atrocious assault level.

Nonviolent crimes are the sum of breaking and entering, larceny and motor vehicle theft. The first two of these sub-elements have a comparatively regular incidence to total. Indeed breaking and entering, as a proportion of the total nonviolent crimes, is much more a characteristic of small communities than of the larger ones. Larcenies tend to rise quite sharply with city size, while motor vehicle theft is very largely a crime of big cities. The latter's incidence per thousand for cities of over 60,000 is six times the rate of the smaller communities considered.

Changes in Crime Rate Over Time

The data reported earlier are crime rates per thousand for 1975. Perhaps of equal significance are the changes in these rates over time. These are shown in Exhibit A-3 which indicate the annual percent change in crime rate per thousand population from 1970 to 1975 for the 563 communities considered here. The data are reported in terms of simple annual percent changes on average for the five year period. It is striking to note that while the average for all communities there was an annual average crime increment of 19.6 percent, the increase was most pronounced in small communities. Indeed, the increment in communities over 60,000 -- 7.9 percent -- was barely a third of that in communities at the 1,000-2,500 mark, with a clearcut gradient in between.¹⁰

¹⁰The change in total crime rate for the state of New Jersey presented in Exhibit 5 is skewed, due to their representation, towards the change in crime rates of smaller cities. For the state as a whole, the annual change in total crime rate from 1970-1975 was 12.2 percent.

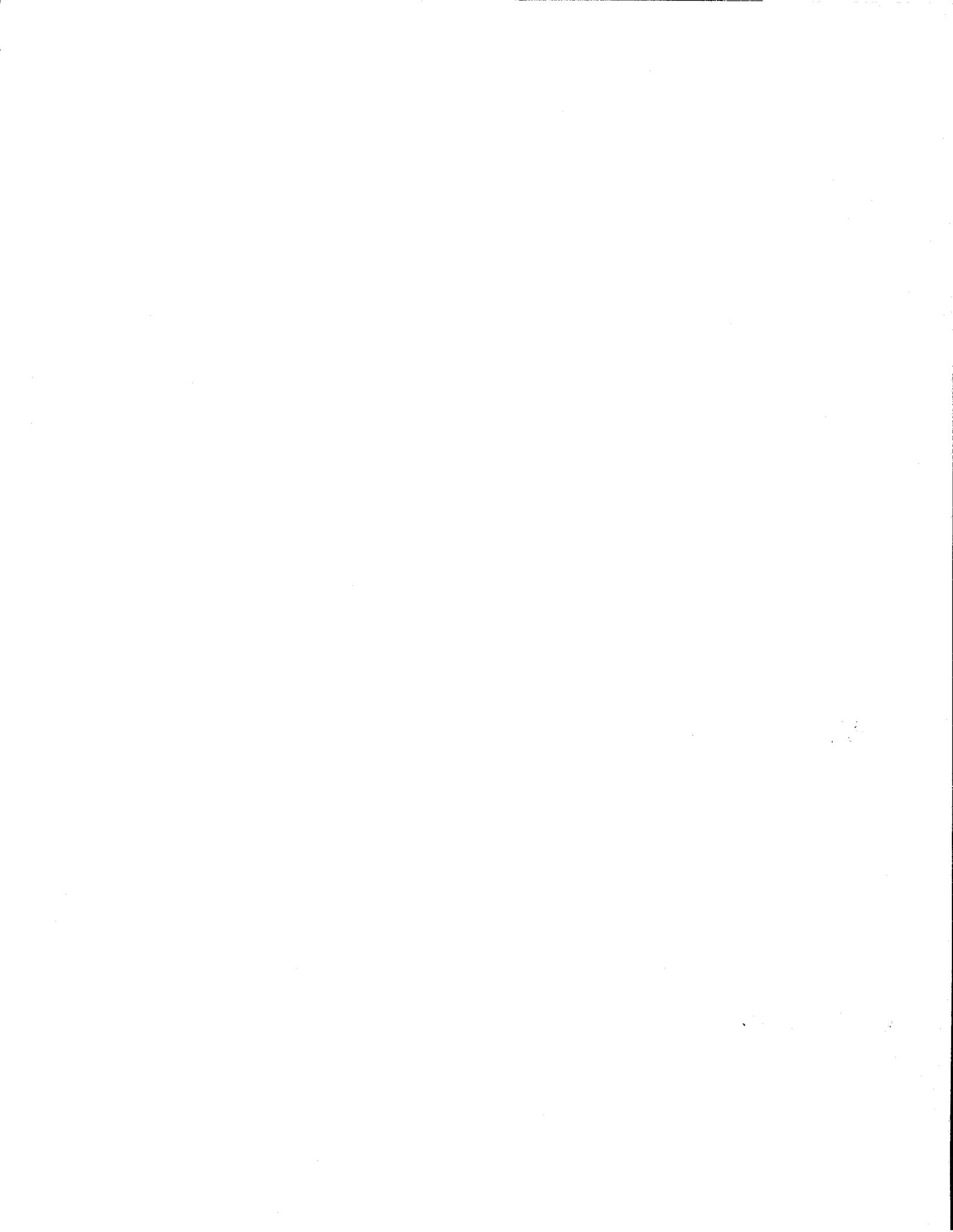


EXHIBIT A-3

ANNUAL PERCENT CHANGE IN CRIME RATE PER 1,000 POPULATION FOR NEW JERSEY MUNICIPALITIES BY CITY SIZE --
1970-1975 -- INDEX OFFENSES

City Size	Annual Crime Rate Change	Violent Crime Annual Rate Change	Murder Annual Crime Rate Change	Forcible Rape Annual Crime Rate Change	Robbery Annual Crime Rate Change	Atrocious Assault Annual Crime Rate Change	Non- Violent Crime Annual Rate Change	Breaking and Entering Annual Crime Rate Change	Larceny Annual Crime Rate Change	Motor Vehicle Annual Thefts Crime Rate Change	
200 - 1,000	45.2	-3.0	0	- .6	-3.6	- .5	47.5	49.2	36.0	-1.6	
1,001 - 2,500	22.2	6.5	-1.3	-2.4	- .9	2.0	22.4	26.0	36.2	6.3	
2,501 - 10,000	19.0	24.2	-1.7	-2.1	9.3	25.3	18.9	19.4	31.6	14.3	
10,001 - 20,000	17.0	31.8	-1.0	4.5	17.3	37.8	17.1	16.8	24.6	13.2	
20,001 - 60,000	13.3	20.9	3.5	6.6	18.8	39.7	13.1	12.2	17.5	4.3	
Over 60,000	7.9	16.2	6.0	8.6	11.3	33.5	7.3	9.0	13.4	- .8	
All Municipalities	19.6	20.9	- .6	.7	9.7	20.2	19.8	20.6	29.0	10.0	
	c	=	a				+	b			
			a	=	a ₁	+	a ₂	+	a ₃	+	a ₄
					b	=	b ₁	+	b ₂	+	b ₃

Source: Uniform Crime Reports - State of New Jersey (West Trenton, N.J. State of New Jersey
Division of State Police, 1975, 1970).

Both the annual violent crime rate and nonviolent crime rate grew equivalently. The level of incidence by community size in the former, however, is much more erratic as a function of community size than the latter, the peak increment is at the 10,000-20,000 size community. This at 31.8 percent, is substantially in excess of the average for all communities - 20.9 percent. In the nonviolent group of crimes, the high growth areas, as earlier indicated, were the smaller communities.

The subsets of crimes within each of the major categories shows substantial variance. But all of the crimes of violence tend to increase most significantly as a function of increase in the size of community considered. It is striking to note in this context some level of reversal of this trend when breaking/entering and larceny are considered. Here the rates of incidence clearly have moved to the smaller community. The motor vehicle theft rate of increment shows a "U" shaped curve with both the smallest and largest sets of communities showing the smallest level of increment.

Police Manpower per Thousand Population

Despite the significant variations in crime rates as a function of community size, there is a comparatively flat pattern of police manpower per thousand population for New Jersey's municipalities regardless of size.¹¹ As shown in Exhibit A-4 if we eliminate the smallest communities - those

¹¹ See: George Sternlieb et al. Housing Development and Municipal Costs (New Brunswick, N.J. Rutgers University, Center for Urban Policy Research, 1975).

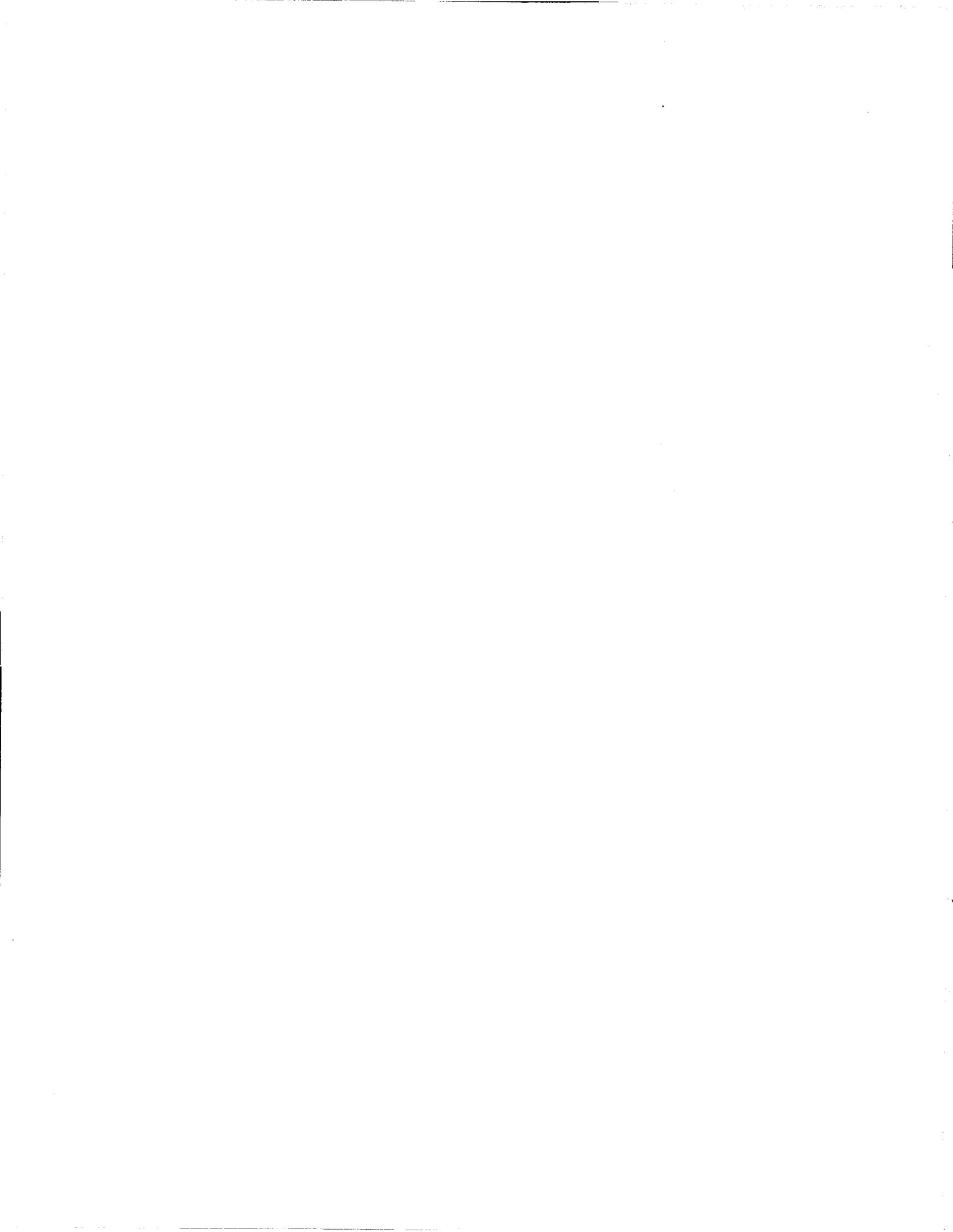


EXHIBIT A-4

POLICE MANPOWER PER 1,000 POPULATION AND POLICE EXPENDITURES PER CAPITA IN NEW JERSEY
MUNICIPALITIES BY CITY SIZE -- 1975

<i>City Size (1975 est.)</i>	<i>Total Employees</i>	<i>Uniformed</i>	<i>Civilian</i>	<i>Expenditures</i>	<i>Expenditures as a Percentage of All Local</i>
200 - 1,000 (n=32)	1.38	1.24	.14	\$38.95	.159
1,001 - 2,500 (n=98)	2.41	2.17	.24	46.88	.207
2,501 - 10,000 (n=233)	2.20	1.94	.26	58.71	.371
10,001 - 20,000 (n=116)	2.21	1.94	.27	38.66	.172
20,001 - 60,000 (n=71)	2.41	2.14	.27	39.35	.240
Over 60,000 (n=13)	3.10	2.70	.40	35.18	.210
All Municipalities (n=563)	2.24	1.98	.26	48.81	.256

Source: Report of the Division of Local Government Services (Trenton, N.J., State of New Jersey, Department of Community Affairs, 1975).

with populations of 1,000 or under and the largest - those over 60,000 - both in uniformed and nonuniformed employees, the pattern is comparatively similar. It clusters closely near the average for the entire group of 1.98 for uniformed, 0.26 for nonuniformed. Thus the very commonly used national planning standard of two uniformed policemen per thousand population seems to predominate!¹²

For the 13 communities of over 60,000 there is an abrupt increment with the uniformed force moving up to the 2.70 level; the civilian group actually showing an even higher proportionate increment at the 0.40 level. This is completely in line with the increased complexity and paper-work involved in a large organization, which by definition typically requires much more in the way of hierarchial structure.

Police Expenditures Per Capita - Police Expenditures as a Percent of Municipal Expenditures

While police manpower rates are relatively constant for all but the extreme population categories, police expenditures per capita appear to show much more variation by city population categories. It is lowest for the extreme population categories and increases from both ends to a peak for communities of 2501-10,000 population. At this latter city size, expenditures per capita are 1 1/2 times those found both in communities under 1,000 and over 60,000 population (Exhibit A-4).

¹² International City Management Association, The Municipal Year Book - 1977 (Washington, D.C. ICMA, 1977), p. 93-94.

Even more striking are the figures for aggregate police expenditures. Again similar trends are in evidence with more emphasis in mid-size communities than extreme size communities yet their disparity is greater. Police expenditures as a percent of all local expenditures for communities of 2501-10,000 are more than twice what is found for communities under 1000 population and 1 1/2 times what is found for communities of over 60,000.

Obviously intergovernmental transfers to support both police and other service functions at the population extremes enable the service burden to be diminished in these categories of cities.

LAND USE IN NEW JERSEY

Municipal Land Use in New Jersey Municipalities - 1975

In the analyses which follow the variable chosen to describe land use distribution in New Jersey municipalities in 1975 and change in this distribution over time (1970 to 1975) is *state equalized valuation per capita*. Per capita valuation is broken down into four property classifications of land use common to most New Jersey municipalities --- single family, apartment, commercial and industrial.¹³ Although there is a definite difference in market value per acre across these property classifications thus possibly overestimating development in commercial acreage and underestimating that in residential, it is felt that the change

¹³ Farm and vacant land property classifications have been eliminated from the analysis.

in property value per community, expressed in constant dollars, is a much better index of local growth than change in the number of local land parcels. For instance, the development of two regional shopping centers of 2,000,000 Ft² and 75 stores each, according to local tax records, added only one "parcel" to the tax rolls of each of the communities in which this development took place. It is felt that the addition of close to \$50,000,000 to the ratable bases of these communities (state equalized total property valuation) much more accurately states the magnitude of local growth taking place as a function of this development. Similarly, as indicated previously, real property valuation and valuation change *per capita* is a long standing measure of *inter-community* growth for intergovernmental revenue transfer purposes.

Exhibit A-5 summarizes the distribution of the ratable base per capita in New Jersey municipalities in 1975, by city size. From this exhibit the single family orientation of communities in New Jersey is strikingly clear. Average single family real property valuations per capita in most city size categories is 3-4 times their combined industrial and commercial valuations and 6-8 times their apartment real property valuation. New Jersey's role historically as a composite of "bedroom communities" for New York and Philadelphia, its more recent receptivity to emerging commercial and industrial land uses and finally its continuous rejection of extensive multifamily development

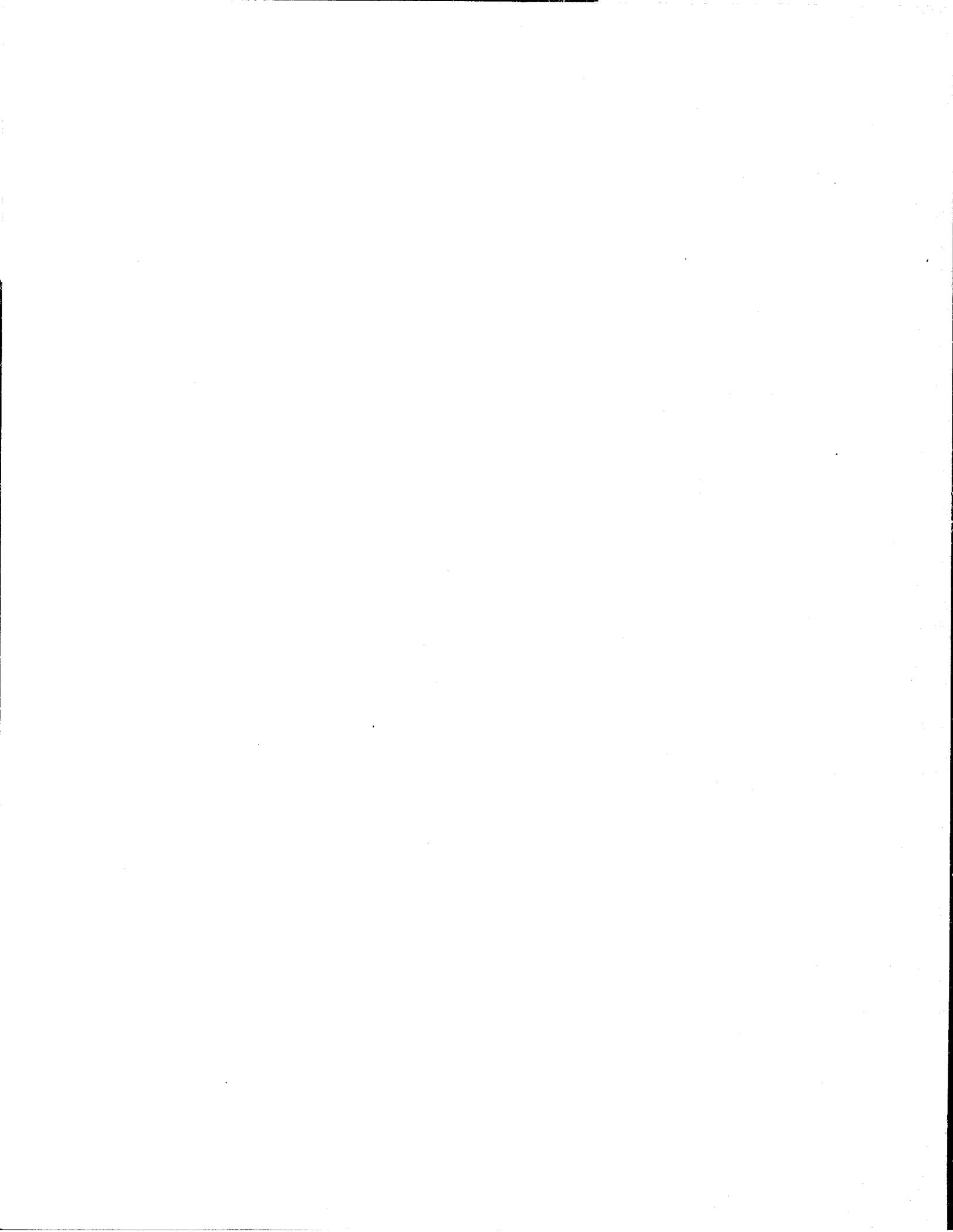


EXHIBIT A-5

PER CAPITA STATE EQUALIZED REAL PROPERTY VALUATION FOR NEW JERSEY MUNICIPALITIES BY
CITY SIZE AND PROPERTY CLASSIFICATION -1975

<i>City Size (1975 est.)</i>	<i>Single Family Valuation</i>	<i>Apartment Valuation</i>	<i>Commercial Valuation</i>	<i>Industrial Valuation</i>
200 - 1,000	\$20,780	\$153	\$1802	\$3660
1,001 - 2,500	15,687	672	2402	1113
2,501 - 10,000	10,776	560	2208	1226
10,001 - 20,000	10,089	763	1859	1463
20,001 - 60,000	8,302	948	1856	1680
Over 60,000	7,989	747	2083	2311
All Municipalities	11,785	644	2104	1464

Source: Report of the Division of Local Government Services
(Trenton, N.J., State of New Jersey Department of
Community Affairs, 1975).

provide reasons for the land use distributions shown in this exhibit.

Real property valuation per capita except for the smallest category of cities (under 1000 population) is relatively constant for apartment and commercial uses, decreases for residential uses and increases for industrial uses. Thus, in larger cities there is less valuation per capita in single family housing and more in industry than is the case in smaller cities. This obviously reflects the typical land use concentration of each of these two geographic areas.

Change in Land Use Distribution, 1970-1975

Exhibit A-6 shows the growth which has taken place in municipal land use categories over the period 1970 to 1975. Growth is measured as change in real property valuation per capita. To more accurately portray real growth change, 1970 property valuations have been inflated by an index of the cost of state and local government services over time.¹⁴ Thus, minus inflation, the land use change exhibited here is almost exclusively a function of net additions or subtractions to a community's existing ratable base. As such, it is clear, that except for the smallest population size grouping, changes in residential land use (both single

¹⁴ See "Implicit Price Deflators for Gross National Product, 1929-1976: Government (State and Local) Purchases of Goods and Services" in Economic Report of the President (Washington, D.C. Government Printing Office, 1977) Table B-3, p. 191.

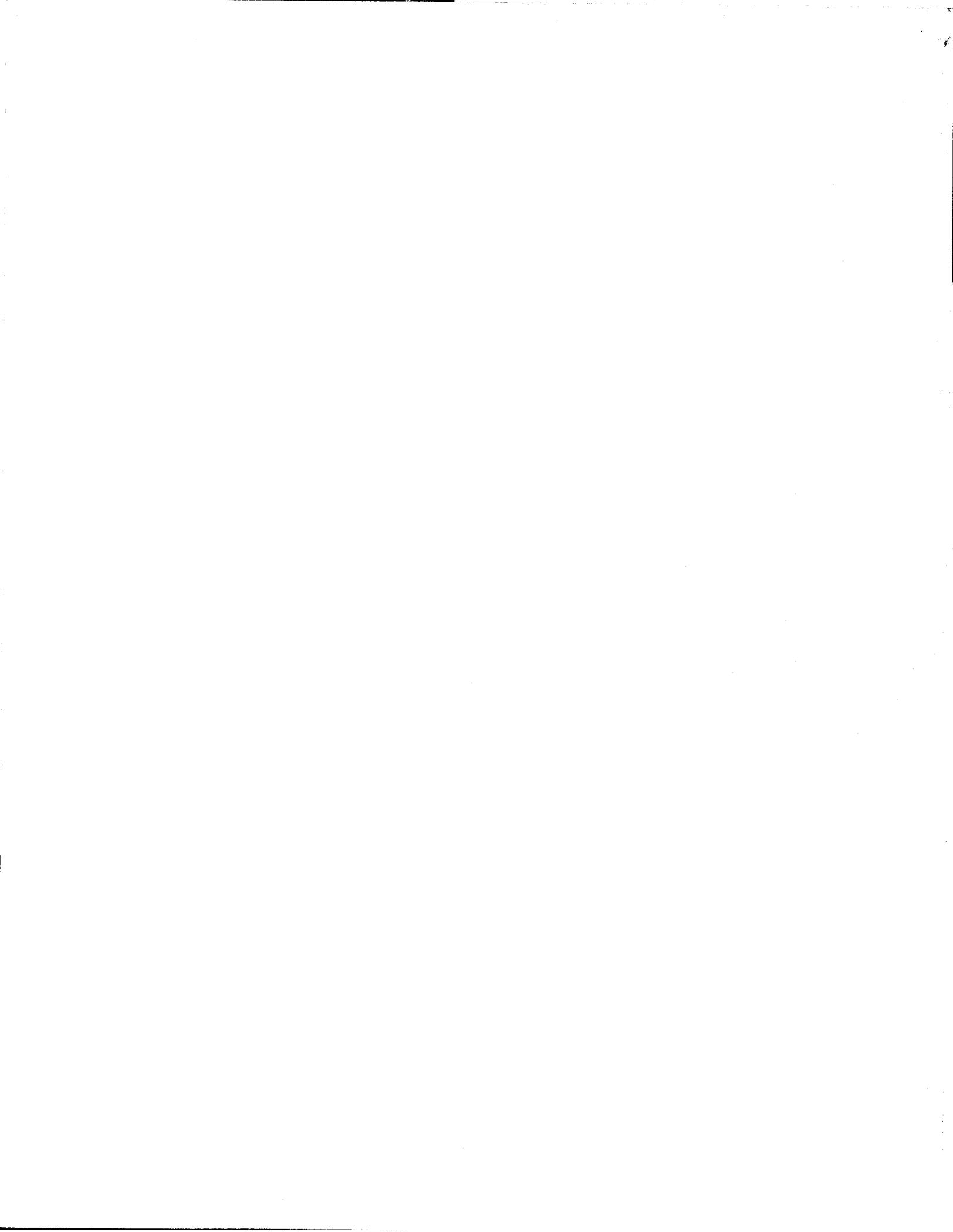


EXHIBIT A-6

ANNUAL PERCENT INCREASES IN PER CAPITA STATE EQUALIZED REAL PROPERTY VALUATION FOR
NEW JERSEY MUNICIPALITIES BY CITY SIZE AND PROPERTY CLASSIFICATION--1970-1975

<i>City Size (1975 est.)</i>	<i>Single Family Valuation</i>	<i>Apartment Valuation</i>	<i>Commercial Valuation</i>	<i>Industrial Valuation</i>
200 - 1,000	8.27	2.42	12.63	2.07
1,001 - 2,500	8.69	10.74	6.53	3.96
2,501 - 10,000	6.19	10.82	9.74	5.19
10,001 - 20,000	4.53	6.71	9.73	5.03
20,001 - 60,000	5.00	6.74	5.68	5.22
Over 60,000	3.46	6.08	7.44	5.23
All Municipalities	6.24	8.93	8.85	4.94

Note: 1970 Property Valuations adjusted to constant 1975 dollars.

Source: Report of the Division of Local Government Services (Trenton, N.J., State of New Jersey, Department of Community Affairs, 1975, 1970).

BIBLIOGRAPHY

- Black, Donald J. 1970. "The Production of Crime Rates", American Sociological Review, 35 (4): 733-748.
- Boggs, Sarah L. 1965. "Urban Crime Patterns," American Sociological Review, 30: 899-908.
- Cohen, Joseph. 1941. "The Geography of Crime," Annals of the American Academy of Political and Social Science, 217: 29-37.
- "Computers and Police: Police Departments and the New Information Technology." 1974. Urban Data Service Report, November 1974, p. 19.
- Dunn, Christopher S. 1976. "Pattern of Robbery Characteristics and their Occurrence Among Social Areas," Criminal Justice Research Center, Albany, New York for the U.S. Department of Justice, Utilization of Criminal Justice Statistics Project, Report 15.
- Gardiner, R.D. 1976. "Crime and Neighborhood Environment," HUD Challenge, 8(2): 9-13.
- Harries, K.D. 1973. "Spatial Aspects of Violence and Metropolitan Population," Professional Geographer, 25(1): 1-6.
- Harries, K.D. 1973. "Social Indicators and Metropolitan Variations in Crime," Proceedings: Association of American Geographers, 5: 97-101.
- Haynes, R.M. 1973. "Crime Rates and City Size in America," Area, 5(3): 162-165.
- Kaplan, S.J. 1960. "The Geography of Crime," in: Sociology of Crime, ed. by J.S. Roucek. New York: Philosopher's Library, 160-192.
- Lee, Y. and F. Egan. 1972. "The Geography of Urban Crime: The Spatial Pattern of Serious Crime in the City of Denver," Proceedings of the Association of American Geographers, 4: 59-64.
- Mays, J.B. 1968. "Crime and the Urban Pattern," Sociological Review, 16, 241-55.
- Nieburg, H.L. 1974. "Crime Prevention by Urban Design," Society. 12(1), Nov/Dec, pp.41-47.
- Normandeaw, A. and B. Schwartz. 1971. "A Crime Classification of American Metropolitan Areas," Criminology, 8: 228-247.

- Ogburn, William F. 1935. "Factors in the Variation of Crime Among Cities," Journal of the American Statistical Association, 30: 12-34.
- Phillips, P.D. 1972. "A Prologue to the Geography of Crime," Proceedings of the Association of American Geographers, 4: 86-91.
- President's Commission on Law Enforcement and Administration of Justice. 1968. "The Ecology of Crime," in: Crime in a Free Society, ed. by R.W. Winslow. Belmont, California: Dickenson Publishing, 142-162.
- Price, J. 1966. "Test of the Accuracy of Crime Statistics," Social Problems, 14: 214-226.
- Pyle, G.F. and D.M. Smith. 1974. Spatial Dynamics of Crime, Research paper no. 159, Department of Geography, University of Chicago.
- Skogan, Wesley G. 1977. "The Changing Distribution of Big-City Crime: A Multi-City Time-Series Analysis;" Urban Affairs 13(1) Sept.: 33-49.
- Smith, David. 1972. "Crime Rates as Territorial Indicators." Paper presented to the 68th Annual Meeting of the Association of American Geographers, April 1972.
- Springer, Larry. 1972. "Crime Anxiety and Behavior in Space." Paper presented at 1971 meeting of the East Lakes Division of the A.A.G., Kent, Ohio, mimeographed.
- Strahan, B.L. 1975. "Geographic Base Files: A Tool for Effective Agency Operations," The Police Chief, 42(12): 46-49.
- Watts, R.E. 1931. "The Influence of Population Density on Crime," Journal of the American Statistical Association, 26, 11-20.



BEHAVIOR TECHNOLOGY AND THE MODIFICATION OF CRIMINAL BEHAVIOR
THROUGH ENVIRONMENTAL DESIGN AND MANAGEMENT*

Raymond G. Studer

Center for Research in Urban and Environmental Planning

Princeton University
(on leave from the Pennsylvania State University)

1 March 1978

*Prepared for the Westinghouse Issues Center.



BEHAVIOR TECHNOLOGY AND THE MODIFICATION OF CRIMINAL BEHAVIOR
THROUGH ENVIRONMENTAL DESIGN AND MANAGEMENT

Raymond G. Studer

Where an appropriate technology exists and the self-interest of persons can be linked to its operation, there are virtually no limits to what men in organizations can achieve. Where no such technology exists and the inducement is mere piety, there is scarcely anything an organization can do except grow and become meddlesome. (Wilson, 1975)

Violent crime, a class of human behavior which has become such a ubiquitous aspect of contemporary urban life, constitutes perhaps our most perplexing and ugly social problem--a seeming contradiction in our social evolution. Disagreements among social scientists regarding the causes of and cures for crime have been amply documented both in scholarly journals and in the popular media. In his book Thinking About Crime (1975) James Q. Wilson has captured some of the essence of our frustrating search for a viable approach to this difficult social problem. Let us turn briefly to his observations in this regard.

Policy formation with regard to crime in the sixties and early seventies was directed by conventional wisdom which tells us that people engage in criminal behavior in response to stressful material living conditions, e.g., poor housing, poverty, unemployment, poor educational resources. We thus launched an all out attack on these "root causes" and indeed produced a considerably higher aggregate standard of living. This development was, however, accompanied by a significantly higher aggregate crime rate! Wilson notes that this was no surprise to most criminologists, for the conventional wisdom guiding public policy during that period was

in fact inconsistent with the prevailing social science perspective regarding the causes of crime. Indeed criminologists have generally rejected the view of objective causation (e.g., that individuals assess the costs and benefits of criminal acts, and behave accordingly). They seek rather to explain criminal behavior as resulting "from the same social processes as other social behavior", i.e., "the hypothesis of natural causation" (Sutherland and Cressy, 1966). From this "sociological perspective" attitude formation is the key process to be investigated. Attitudes are, it is asserted, shaped and supported by intimate group or peer pressure (i.e. family and close friends), "we/they" social group isolation (the "theory of differential association") and a social milieu espousing "lower class values". Within this perspective empirical investigations of criminal behavior emphasize: 1) how crime varies with social structure and process (e.g., class, neighborhood, mobility, density, spatial distribution) and, 2) how people are induced into a life of crime (e.g., peer group pressure, family influences, attitude formation).

The problem with this search for root causes--with the prevailing social science perspective--Wilson argues, is that it has failed to produce either a theoretical or empirical basis for policy formation, i.e., "ultimate causes cannot be the object of policy efforts precisely because, being ultimate, they cannot be changed." It is indeed difficult to imagine feasible policy which could make families: stable, embrace good law abiding values, be affectionate toward children and execute fair discipline. The family is not an agent of government, and policies to change "family values" or "men's minds" seem incomprehensible. If we cannot alter such states we cannot get at the causes of crime according to the prevailing sociological perspective. Wilson's implicit argument, then, is that the paradigmatic underpinnings of research into the causes of crime has led to the identification of (social)

variables least accessible to policy formation and programs of intervention.

Unlike the social scientist the policy analyst/planner/environmental designer cannot as a rule ponder "basic causes," but must identify courses of action which produce desired social outcomes. "Given what he has to work with he may gain more by altering risks, benefits, alternatives and accessibility rather than trying to change the mental states of citizens" (Wilson 1975). In other words, the interventionist, as such, must focus not on the search for underlying causes of criminal behavior, but upon the means of altering it in appropriate ways. He generally seeks through policy and program formulation to increase legitimate opportunities for people to meet their goals while reducing the illegitimate ones. Criminologists will have no part of this, according to Wilson, and deem it uninteresting, superficial and symptomatic, not causal.

Wilson goes on to analyze aspects of the criminal justice system, i.e., enforcement, adjudication, corrections, and essentially concludes that the only reliable datum we actually do have is that during the time when crime-prone individuals are locked up they are unlikely to victimize law abiding citizens. Someone must have been listening; our prison population has been rising sharply over the last couple of years.

Wilson's perspective on crime and recommendations for its reduction, while based on some hard, cold facts, are understandably considered reactionary by many in the criminal justice field. His comments have been introduced here to point up some of the difficulties we face regarding certain disparities between our search for the etiology of criminal behavior on the one hand, and appropriate policies and programs of intervention on the other. In any event it appears that we must get on with the work of altering criminal behavior even while

waiting for those elusive explanations of its "root causes".*

Given the above state of affairs, it is not surprising that we should observe significant differences among practitioners in the criminal justice field regarding preferred courses of action to control crime. These differences in approach are based on three levels of belief: ideological, epistemological and methodological. Crime control in a democracy is intrinsically difficult in that most of us operate within an ideological belief system which precludes the violation of certain individual freedoms and initiatives. Faced with the prospects of a criminal act, however, the principle becomes less clear. We thus find criminal justice specialists committed to a fairly wide range of crime control strategies which reflect various interpretations of the basic ideological tenets which we all ostensibly share. In the area of corrections, for example, there is no agreement whatsoever on the goals and objectives of incarceration (e.g., reform, restraint, rehabilitation, reintegration) within the criminal justice community, nor, for that matter, even within particular institutions (Duffee 1975). Sommer (1976) refers to this reality as the "model muddle"; it is engendered primarily by conflicting ideological beliefs.

But at another level the "model muddle" is linked to certain conflicting and often unexamined epistemological beliefs; that is, assumptions regarding the etiology, or basic causes of human behavior, and criminal behavior in particular. To what extent is human behavior voluntary, under the control of the individual's "will" or internalized (cognitive) functions; and to what

* Indeed, it is just possible that so called criminal "attitudes" may actually be products of recurring patterns of behavior. Certainly it is from observations of behavior that we often infer a particularly held attitude (and then proceed to identify it as a cause of that behavior!)

extent is that behavior under the control of environmental influences? One cannot long deal with criminal offenders without taking a position on such matters. The position thus taken leads to (or is influenced by previous) embracement of particular theories, paradigms, models, units and methods of behavioral analysis and intervention. Wilson has attempted to illuminate the difficulties involved in linking the research paradigms (epistemologies) embraced by main stream criminologists to action, i.e., policy and program formulation.

The purpose of the above comments is to make two points. The first is that we need to untangle the "model muddle"--to understand that the strategies we employ to deal with criminal behavior are either implicitly or explicitly linked to certain ideological and epistemological tenents. To the extent that the ideological, epistemological and methodological levels do not become muddled (either horizontally or vertically as it were), the enterprise is well served. The second point is that when we seek to utilize resources from the behavioral sciences we should do so in the context of developing implementable and effective policies and programs of intervention. Beyond noting that some resources in the social/behavioral sciences may be more directly applicable to certain classes of human problems than others, it is not our purpose here to argue (explicitly at least) for the superiority of one behavioral explanation over all others. What is at issue is the development of an approach to organizing the environment to effect changes in criminal behavior.

In the remainder of this paper I will attempt to outline a learning theoretic approach to the CPTED (Crime Prevention Through Environmental Design) task. I will review the principles and processes underlying operant-based behavior technology, and its general relevance to the multi-component criminal justice system. Moving to the community component, I will then attempt to review the

CPTED approach from an operant perspective. Throughout I will be developing arguments for moving from programs of behavior modification to those of environmental planning, design and management. Finally, I will propose a general decision-making format to deal more comprehensively with behavioral interventions at the community scale to effect reduced levels of criminal activity.

Behavior Technology: Principles and Processes

The behavior of an individual can be seen as the product of: 1) their genetic endowment, 2) their history of interaction with the environment, and 3) the present, impinging environment. Each of us has a unique genetic make up and environmental history, and these produce certain behavioral propensities. Even if we possessed the technical capability to alter an individual's genetic endowment (e.g. via biological engineering or chemotherapeutic interventions) to control his criminal behavior, most of us are not ideologically prepared to do so. As a practical matter we can neither completely understand, nor can we restructure an offender's past environmental history (e.g., the familial, peer and sub-cultural social environments noted above). What we can and do do is to attempt to redirect an offender's or potential offender's behavior via alterations in aspects of the present (and future) environment (or effect policies leading thereto). Let us now turn to an area of research in the behavioral sciences which may have particular relevance to this task.

The experimental analysis of behavior, sometimes called operant psychology, is a field of behavioral science committed to the development of a systematic, functional understanding of the relationship between human behavior and environmental structure. Many insist that the operant paradigm fails to provide a complete explanation of human behavioral processes (e.g., Krutch 1953, Chomsky 1959, Ashby 1967). Be this as it may, few deny that human behavior can be

altered via operant techniques.* It is these techniques of behavior change maintenance--an emerging technology of behavior--which can be seen as directly relevant to the processes of environmental planning, design and management to, e.g., effect changes in criminal behavior.

The principles and techniques which underly the analysis of operant behavior have been developed and extensively documented through decades of research in the experimental laboratory and through their application to a wide variety of real-world human problem domains. An in-depth explication of this system of behavioral science can become extremely complex and tedious as the many volumes written on this subject attest. The controversy surrounding the implementation of behavior modification programs (e.g., in corrections) was engendered by normative rather than technical decisions. However, a pervasive misunderstanding of the technical issues involved has needlessly intensified and prolonged the controversy. We will take up the "behavior mod scare" a bit later on, but for those unfamiliar with this mode of analyzing environment-behavior systems the following is a review of its essential elements. Those familiar with basic operant principles and procedures can profitably SKIP TO PAGE 19.

Operant psychology is not S-R psychology, and operant behavior, that which is "voluntary" and acts on the environment, is to be distinguished from respondent behavior. This later class of "involuntary" behavior, i.e., the conditioned reflex studied by Pavlov, is effected through the pairing of

*For what it is worth this writer embraces the operant perspective as fundamental to the analysis of, and intervention in environment-behavior systems. On the other hand elaboration of the operant paradigm (in ways not unlike those suggested by Landy in an accompanying article) seems necessary in order to refine our predictive capabilities with regard to proposed environmental interventions. Space does not allow a full explication of this modified posture, but aspects of it come through in subsequent comments.

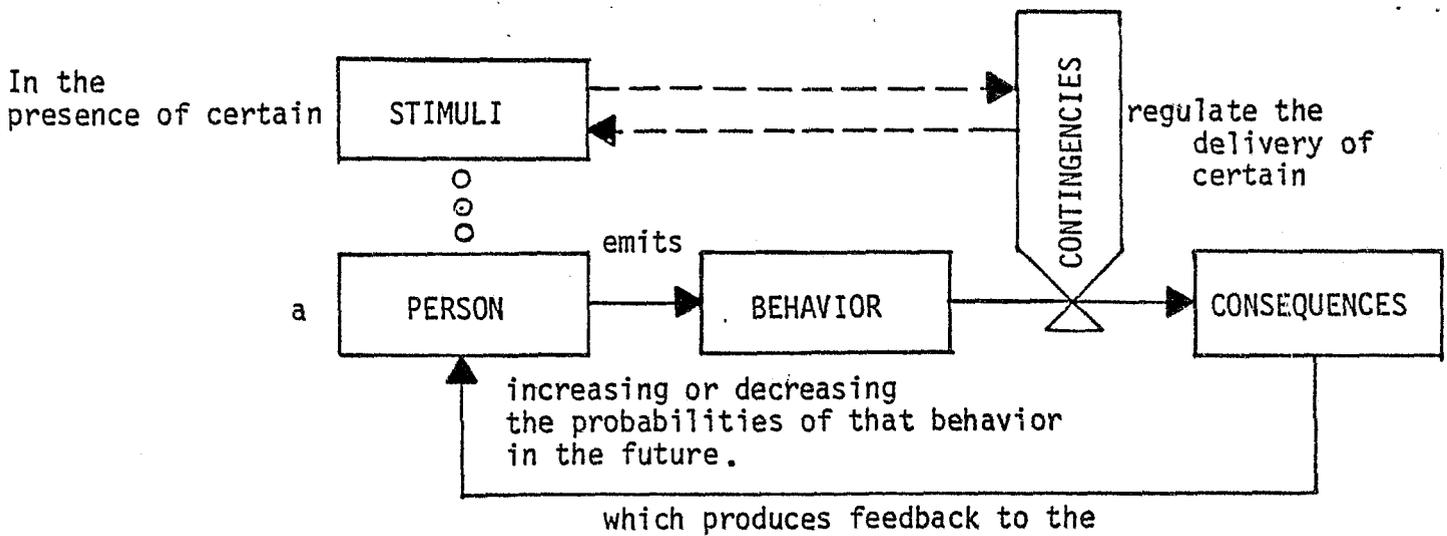
certain stimuli with previously unrelated responses (i.e., those required to maintain homeostasis and physiological well-being, such as fear, anger, flight, hunger). This work, which evolved into something called classical conditioning, was to lay the foundation for operant research, but deals with an analysis distinctly different from that discussed below.

Operant behavior, that which we observe our fellow humans emitting day-to-day, is altered and maintained via environmental feedback. That is, this (voluntary) behavior can, depending on the nature of the environment in which it occurs, produce certain consequences. These in turn alter the probabilities of that behavior's recurrence in the future. If the consequence of the emitted behavior is favorable or reinforcing (with respect to the individual behavior) this increases the probability of that behavior's recurrence; if the consequence is aversive or punishing, this will decrease the probability of that behavior's recurrence. When certain consequences are linked, that is, when they are made contingent upon the emission of a particular form of behavior, then this behavior comes under the control of these consequences. The methods of bringing operant behavior under the control of (social and/or physical) elements of the environment involves the analysis of the (spatial/temporal*) relations between behavior and its consequences, i.e., reinforcers and punishers. Researchers have, thus, extensively documented this basic process of environmental feedback wherein particular forms of behavior are selected out and strengthened. Behavior change and maintenance is effected through the management of certain contingencies between behavior and its consequences operating in a particular setting.

*That is, behavior emitted and its consequences are functionally related if and only if they are perceived as such by the behavior. The consequences thus must be spatially proximate to the behavior and must immediately follow its emission, otherwise no functional relationship can exist. The immediacy of a behavioral consequence is important to its influence on that behavior.

Another aspect of this process has to do with the situation or setting, in which the contingencies operate. When particular behaviors have been reinforced or punished in the presence of particular stimuli, these behaviors become more probable in the presence of these stimuli in the future. The behavior is said to come under the control of those particular stimuli. When we cross a busy street, we learn to routinely attend to the signal light; we stop for a red signal and go on a green one because these behaviors have been linked to certain consequences in the presence of these stimuli in the past. These stimuli have come to have particular "meaning" with regard to appropriate behaviors.

The elements of an operant analysis can be summarized thusly:



Basic Operant Paradigm - Figure One

These are the basic elements of operant behavior analysis, the underlying structure of interactions between people and the environment. The way various contingencies operate in an environment over time produces observed patterns of behaviors. Because many of us occupy the same general environment (e.g., physical elements, sociocultural and subcultural norms), many of our patterns of behavior are similar. Overlaying these common patterns are certain individual and group differences reflecting unique behavioral histories and/or current

systems of contingencies operating thereon.

To take a more pleasant episode, as an example, children rather early come to like cookies. Having perhaps observed his siblings in a similar situation, a child happens on a parent near the cookie jar and emits the behavior of asking (with whatever language skills he has) for a cookie, and the environment (parent) produces a cookie. This increases the probability that the child will, if he is hungry and in the same stimulus situation, ask for a cookie in the future. One day the parent, because of the norms of the social environment, decides that it's time the child learn some manners, requiring a "please" before the cookie is produced. The parent, thus, arranges a new contingency linking the required behavior ("please") to the reinforcer (cookie), and the desired behavior comes under the control of the latter. The child soon generalizes the behavior "please" to other similar situations. We thus acquire through this environmental selection process, manners, conventions, and indeed language itself.

There is more to the story. The cookies weren't given out every time they were requested, the child wasn't always hungry; also the parent may have ignored the request, scorned or, worse, spanked the child for the request. Each of these environmental consequences would have produced a different pattern of responses. We need to probe a bit deeper into this phenomena. Let us now look at each of the elements of the analysis in more detail.

THE PERSON(S): Operant research has been severely criticized over the years for assuming an "empty organism" in its analysis. It is true that this approach to behavior analysis appears to ignore much in the way of cognitive and other processes internal to, and the feelings, purposes and values of the individual emitting the behavior. On the other hand, the power of the analysis comes from this very decision, i.e., to focus on the manifest behavior and the environmental conditions which control its form. Whether or not this decision



Note to Reviewers and Editors: The material between here and page 18 can be readily placed in an Appendix if this seems appropriate.

to reduce environment-behavior analyses to these observable events, ignoring certain mental processes affecting these, will produce a complete and comprehensive science of human psychology is not our concern here; rather it is to understand (criminal) behavior as it relates to various environmental structures and processes. To the extent that we can, it would be useful to know something of the person's(s') environmental-behavioral history in order to know which stimuli, consequences (reinforcers, punishers) and contingencies are likely to be effective in a behavior change program (We can, of course, find this out experimentally, but in programs of intervention this is not always, indeed it is rarely, feasible as will be noted below). In our cookie episode in order to establish "please" behavior we would want to know the child liked cookies, had "please" in his repertoire, that he was hungry and capable of perceiving the cookie jar-parent stimuli.

CONSEQUENCES: Behaviors emitted can produce either reinforcing or punishing consequences (or possibly no perceivable consequences depending on the contingencies in effect). The effectiveness of a consequence has a great deal to do with an individual's state of deprivation and their history of interaction with the environment. A thirsty person will see water as reinforcing (regardless of their history); a person who has been socially isolated may see interaction with another as reinforcing (depending on their history). Thus, both reinforcers and punishers can be either unconditioned or conditioned. Unconditioned reinforcers are those necessary for bodily maintenance, e.g., food, water, protection from the elements. The removal or withholding of these is, of course, punishing as is direct bodily pain. Conditioned reinforcers include such items as social praise, money, symbols of affluence. Withdrawal or denial of these is likewise punishing, as is social disdain, isolation, and monetary fines. Generalized reinforcers are a particularly interesting class

because these can be exchanged for a wide variety of other (conditioned and unconditioned) reinforcers, e.g., goods (including drugs), services, symbols of affluence. Most people, thus, rarely satiate on money, the major example of a generalized reinforcer.

Whether a consequence will be reinforcing or punishing, as well as its salience or strength, must ultimately be determined in terms of its effect on behavior. In the laboratory this can be determined experimentally. In programs of interest to this analysis, i.e., criminal behavior in the community, as well as many others in real world settings, we know little of the environmental histories of relevant populations and must make inferences (regarding their reinforcement potential) based on known characteristics of the population(s) in question. The reader is directed to Landy's discussion of motivational approaches in this regard.

To complete this description of consequences, two additional aspects require attention. Positive reinforcement is what occurs when the presentation of favorable consequence increases the probability of a behavior. Negative reinforcement is what occurs when the probability of a behavior increases with the removal of an aversive or punishing event, e.g., walking away from a caustic or boring speaker is reinforced by the termination of his aversiveness. Punishment operates similarly to decrease behavioral probabilities. Positive punishment occurs when behavioral probabilities are decreased upon presentation of a punisher, e.g., the child asks for a cookie and is slapped or ridiculed. Negative punishment occurs when behavioral probabilities decrease with the loss of reinforcers. For example, our cookie child may have stockpiled a few; if the parent relieved him of one each time he slammed the door on his way out to play, "door slamming" behavior would probably decrease rapidly (depending on other contingencies).

A great deal of our day-to-day behavior is maintained via aversive control, i.e., punishment or fear of punishment. It's a tempting strategy because it's so efficient. In the laboratory an animal will respond to virtual collapse with only an occasional presentation of contingent electric shock. The problem is that extensive use of severely aversive controls can produce serious side effects, e.g., stress indices of various sorts, is ethically repugnant, and is ultimately ineffective. That is, persons under the control of punishing consequences are prone to emit escape behavior, i.e., behavior to terminate an aversive situation, or avoidance behavior, i.e., behavior to delay or prevent the onset of aversive consequences. This particular phenomenon is relevant to the problem of displacement in crime prevention. In general, positive reinforcement is, for both ethical and technical reasons, the preferred method of modifying and maintaining behavior. Effecting programs of positive reinforcement is, on the other hand, more difficult to implement in many real world settings. If there is one thing we have learned in corrections, it is that punishment per se creates more behavior problems than it solves.

STIMULI: When particular behaviors are iteratively reinforced (or punished) in the presence of particular stimuli, the presence of these stimuli come to increase (or decrease) the probability of that behavior in the future. Stimuli that so operate are called discriminative stimuli and the process is called discrimination learning. Through this process certain elements of settings in the environment acquire "meaning," i.e., when discrimination of them leads to certain consequences. We, thus, learn to emit appropriate responses to certain stimuli as we are differentially reinforced in their presence, i.e., certain behaviors are reinforced only in the presence of the discriminative stimuli and that behavior is not reinforced in the presence of other (non-discriminative) stimuli. The

ways we see people responding to elements and settings (systems of stimuli) in the environment, then, depends on the history of consequences associated with these; that is, upon the probabilities of pleasant or punishing consequences such as social disapproval, social approval, or bodily harm. Our cookie lover before very long emits his request whenever he sees the cookie jar together with the parent (the rattle of its lid may bring him from the other room). The successful mugger or robber is similarly under the control of certain stimuli. That is, he develops certain stimulus discriminations when his predatory behaviors are reinforced in the presence of these stimulus situations (e.g., dark or isolated doorways, certain streets with either a few or a large number of people and other stimulus situations wherein these behaviors have been reinforced in the past). One of our tasks in analyzing and modifying criminal behavior is to understand the discriminative stimuli which elicits criminal behaviors.

CONTINGENCIES: Behavior is altered when consequences are made contingent on that behavior. The pattern in which reinforcing consequences are produced affects the strength, rate and pattern of the behavior in question. The various patterns of environmental feedback (consequences) are known as the schedules of reinforcement. One of the more interesting, perhaps surprising, outcomes of numerous experiments in laboratory and field settings, is that when reinforcing consequences are made available on an intermittent schedule, this produces the strongest patterns of behavior. This intermittent patterning of consequences is most common in both natural and man-made settings and is that which maintains most of our day-to-day behavior (i.e., the favorable consequences linked to many of our important behaviors come in seemingly random patterns). The following schedules of reinforcement have been extensively documented:

Continuous: Each instance of the appropriate behavior produces a consequence (reinforcer or punisher), e.g., each time our cookie hungry child asks with a "please" he receives one. (If this goes on for very long the child will satiate and find something more interesting to do.)

Fixed Ratio: A consequence is produced only after a fixed number of appropriate responses, e.g., the child must ask with a "please" a certain number of times before he gets a cookie. Piecework in the factory operates via this schedule.

Variable Ratio: A consequence is produced after a number of responses but this number constantly (and perhaps randomly) varies, e.g., the child, hooked on cookies, continues to beg for and occasionally gets one (from the parent who finally becomes fatigued from resisting). Street people asking for a handout are usually operating on this schedule (the occasional success maintains the quest). It is this same variable ratio schedule of reinforcement to which Las Vegas owes its success.

Fixed Interval: A consequence is produced after a fixed period of time when an appropriate behavior is being emitted, e.g., the child continues to ask for cookies and gets one at certain intervals. (If the interval is one hour, the child will, regardless of whether he can yet tell time, begin to show up about every hour with his request.) Paydays are scheduled this way, but other contingencies operate in most settings to maintain a more even pattern of behavior than would be emitted if payday was the only controlling consequence.

Variable Interval: A consequence is produced after a certain amount of time has passed, but this interval constantly (and perhaps randomly) varies, e.g., regardless of how many times the child correctly

asks for a cookie he gets one every so often. (He continues to ask fairly often just in case.)

Accidental Reinforcement: When a non-contingent consequence follows a certain behavior a relationship is inadvertently established (i.e., the behavior assumes that the behavior emitted produced the reinforcer). This increases the probability that the person will be emitting the behavior the next time the consequence is (randomly) produced by the environment. Rain dances and many other rituals are thus established. Many of our social (and religious) customs owe their origins to this process, not to mention a great deal of our unexamined day-to-day behavior. Our cookie child may be seen one day to be standing on one foot when he makes his endless request (just "for luck" as it were); we can infer what must have happened. If the accidental consequence is highly punishing, useful behavior may be eliminated from a person's repertoire for no apparent reason.

As mentioned earlier, each of these schedules produces different behavioral characteristics. Intermittent schedules are the strongest, i.e., the most resistant to extinction (discussed below). In a behavior change strategy the objective is to establish the "thinnest" schedules feasible, both because it conserves limited resources (e.g., money) and because the behavior is less likely to satiate. Most of our day-to-day behavior is maintained by multiple, overlaid schedules, and this is what makes behavior analysis and intervention so difficult. Isolating a problem behavior, identifying its maintaining consequences and the schedule of its production can be a subtle undertaking. But it is a worthy one if we wish to understand how elements of the environment can be altered to produce more viable behavioral outcomes. Before moving into the next aspect of this

analysis, let us look at two additional concepts: extinction and vicarious reinforcement.

Extinction occurs when a behavior is emitted but is not reinforced, i.e., it is allowed to extinguish. As noted earlier, behavior under the control of intermittent schedules (i.e., variable ratio, variable interval) extinguishes more slowly than that under the control of others and the characteristics of this extinction process have been carefully studied in the laboratory.

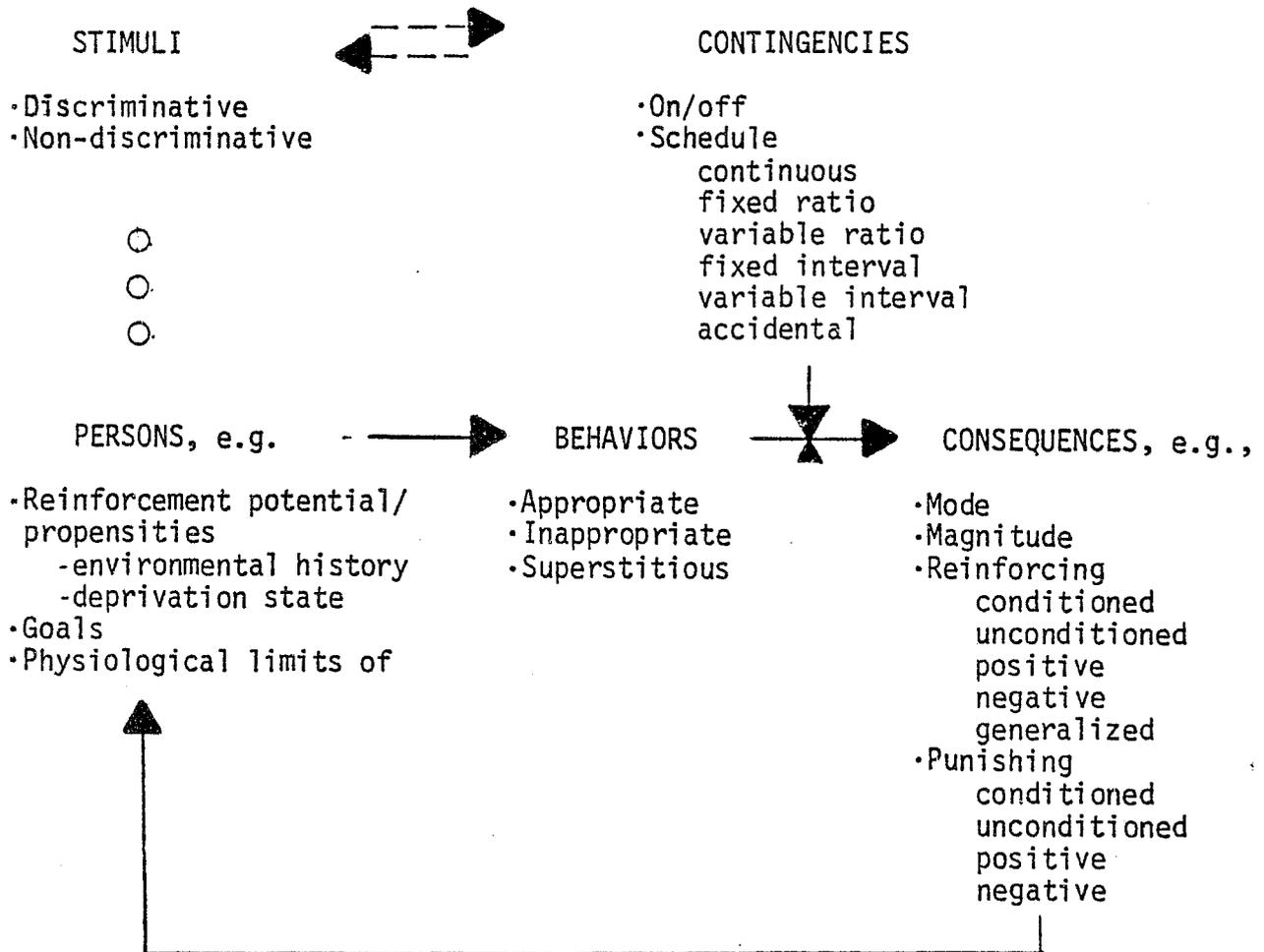
The phenomena called vicarious reinforcement (Bandura 1969) explains about how group behavior emerges and is maintained. This phenomenon, sometimes called social modeling occurs when one individual observes other interacting with the environment--observes the contingencies (linking behavior with consequences) operating. The observer of these interactions comes under the control of these contingencies in a manner closely approximating that of experiencing these contingencies directly.

THE DYNAMICS OF BEHAVIOR CHANGE? New forms, or systems of behavior emerge when certain behaviors are selectively reinforced while others are allowed to extinguish. If our cookie hungry child is given his morsel when he begins to cry (rather than when he says "please"), crying behavior will most certainly increase because it is being systematically reinforced by the parent (who is in turn merely attempting to terminate a noxious stimulus, i.e. is emitting escape behavior). The trick, of course, is to reinforce "please" and ignore "crying". A punisher usually emerges in this situation, however, before the more permanent solution can be consummated.

Moving behavior from one form to another requires an iterative process whereby behaviors approximating the desired form are reinforced, while other, competing behaviors are allowed to extinguish. This process is

sometimes called behavioral shaping.

The major elements of an operant analysis--the principles and processes of the experimental analysis of behavior--can be summarized thusly:



Elements of an Operant Analysis
Figure Two

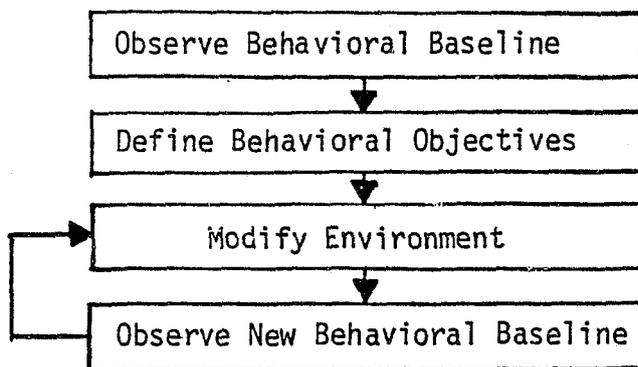
BEHAVIOR TECHNOLOGY: Over a relatively short period of time application of the above operant principles and techniques have moved out of the laboratory into the real world--have been applied to many classes of day-to-day human problems. The extrapolation of operant laboratory findings to real world applications has been more effective than other areas in the behavioral sciences because the variables and processes explored in the laboratory bear

a close resemblance to those found in human problem settings, i.e.:

Technology is the systematic application of tested scientific principles to pragmatic, real-life tasks and problems. On these terms, applied behavior analysis, or behavior modification, is a behavioral technology par excellence. In fact, the basic research paradigm is also the basic treatment paradigm and the basic research manipulation--contingency management--is also the treatment manipulation. The close coordination of the treatment model to the research process surrounds applied behavior analysis with an enviable degree of explicitness, rigor and precision. (Willems 1974)

Behavioral technology, the application of operant principles developed in the experimental laboratory, involves two principle mechanisms: 1) contingency management and 2) stimulus discrimination learning. These are the two principle techniques effecting behavior change and maintenance. Contingency management simply involves the arrangement of the environment such that the probabilities of appropriate consequences are made contingent upon--are produced as a function of the emission of appropriate behaviors (or forms of behavior approximating these). As noted above, acquisition of effective stimulus discriminations is facilitated when certain behaviors are iteratively reinforced in the presence of certain stimuli.

Behavior modification strategies utilizing both contingency management and/or stimulus discrimination learning involves the following sequential operations (see Figure Three):



Behavior Modification Strategy
Figure Three

- 1) Analyze base line conditions, i.e. assess existing rates of (target) behavior(s), related consequences and contingencies linking behavior(s) to consequences.
- 2) Define behavioral objectives, i.e. specification of new forms and rates of behaviors desired.
- 3) Alter the environment (contingencies).
- 4) Assess the resulting behaviors.
- 5) Iterate 3 and 4 until behavioral objectives are met.

This well documented intervention/behavior change strategy has applicability to a wide variety of human problem domains where behavior change is indicated. The process is an iterative one because the changing of behavior from one complex form to another cannot be accomplished in an "all or none" fashion. Research in human learning (empirically defined as a change in behavior) confirms that such transformations require a series of intermediate states, i.e., behavioral shaping through successive approximation, as noted earlier.

A problem of extensive behavior change for most human settings appears an extremely complex enterprise. If entirely new repertoires were required of all participants, the task would, of course, be intractable. Relative to the total behaviors emitted in a setting, the elements requiring modification usually represent but a very small subset. Three processes are involved: 1) strengthening of existing behaviors deemed appropriate or desirable, 2) extinction of undesirable behaviors, and 3) shaping of new requisite behaviors. That is, some of the behaviors observed in a setting are assumed to remain intact, some are strengthened and some are eliminated.

The above techniques, i.e., behavioral technology, have been applied in a number of human settings. Perhaps the first were in education (Skinner 1968) beginning with the teaching machine, then contingency management in the classroom. Soon thereafter, these techniques were implemented in programs for psychiatric patients, the mentally retarded; individuals and groups (e.g., via token economies) such as prisoners, drug addicts, alcoholics and many other special populations (Holland 1974; Kazdin 1975). Most programs of behavior modification up until the early seventies were executed in treatment, rehabilitation and educational settings. More recently, however, operant techniques have been applied to more complex social and environmental problems (Kazdin 1976), e.g., pollution control, energy consumption, racial

integration, littering, solid waste management, mass transportation, job performance, employment procurement, community self-government and military training. We are not dealing here with some future eventuality, but with a technology in current use, or misuse as the case may be.

The "behavior mod scare" in corrections (Sommer 1976) really should be dealt with here, but the situation has become so convoluted--has so misrepresented and muddled the scientific, technical and ethical issues involved, that space simply does not allow us to unravel it all. The reader is urged, however, to review carefully Robert Sommers' analysis of this phenomena in The End of Imprisonment (1976). Suffice it to say that behavior technology can, like physical technology, be both technically botched and brought into the service of questionable ideologies. To blame the technology (or worse, the basic research which produced it) when these things happen compounds misunderstanding with irrationality.

From Behavior Mod to Environmental Design and Management

The operant paradigm has understandably mobilized an army of vigorous critics both within and outside the behavioral science community. Some of the criticisms are ideological, e.g., the "dignity of man", "who controls the controller"; some of them are epistemological, e.g., "humans are thinking, purposeful, feeling beings whose behavior cannot be understood in terms of contingencies of reinforcement." Space does not allow a full review of the various dissenting points of view. For purposes of environmental-behavioral planning, design and management many of these criticisms are either irrelevant or (epistemologically) irreconcilable in any event. Of the various criticisms which have emerged the following seem especially relevant to environmental planning, design and management at the community (or larger) scale.

- 1) Which aspects of programs of behavioral intervention are normative, i.e., deal with people's goals, and which are empirical, i.e., deal with the technical means of achieving these goals? Behavior modifiers have in the past tended to ignore or muddle the distinction between these two levels of analysis and action.
- 2) Who establishes the goals and objectives of behavior change programs and how are these identified and ordered?
- 3) Who controls the controller?
- 4) Operant psychology was developed and essentially deals with single organisms (individuals); can this paradigm really be applied to aggregate populations?
- 5) Operant-based technology lacks both an ecological and a systems perspective and when implemented in more complex settings may produce serious and unexpected second and third order, system-wide effects resulting from intervention in a particular component.
- 6) The effectiveness of and predictions involved in implementing operant-based programs of behavior change depends on an understanding of not only the goals but also the propensities (reinforcement potential) of a population; these cannot be practically ascertained through experimentation in most settings of interest.
- 7) More generally, community-scale interventions of interest (i.e., those subject to a complex set of interdependent constraints and functions) involve certain social, economic, political or even physiological risks; the implementation of untested behavior change strategies (on an experimental basis) is not really feasible due to the possibility of irreversible impacts.

The decision-making model invoked in most behavior modification programs to date was depicted earlier (p. 19). To deal with the above criticisms, and/or to enter into programs of intervention in more complex, real world settings (e.g., at the community scale), will require a more sophisticated approach to decision-making than that depicted (in Figure Three).

The arguments for a behavior-contingent approach to environmental design (e.g., Studer 1970, 1971) grow out of the realization that designed environments should, but often do not, reduce the disparity between human intentions (goals) and their accomplishments (their behaviors). Since accomplishments depend upon what people do, i.e., upon their behavior, requirements for the supporting environment must be developed in the same dimensions. The objective

of environmental design is to realize an alternative state of human affairs, to organize or reorganize environmental elements such that human behavioral goals and objectives can be realized. The claim here is that in directing our attention to the behavioral requirements of a population (an index of biological and extrabiological "need"), we are in a position to identify a decision-making format--a general environmental design and management strategy--within which relevant, but disparate areas of information and methodology can be more incisively focused.

Before moving on, let us clarify what is meant by "environment" in these discussions. The term "environment" is a construct employed for conceptual convenience to study the effects of one system upon another. The distinction between people and their environment is but one such convention. Moreover, there is not one human environment but many; it can be partitioned into infinite sub-environments depending on the objectives of the analysis in question. It is entirely reasonable to isolate and speak of, e.g., the economic, political, physical or any number of other environments; or to speak more generically of a problem situation as composed of the internal environment, i.e., the system under analysis, and the external environment, i.e., the system impinging on and constraining the system under analysis (Simon 1969).

Many researchers concur that environmental design and management should be directed toward the realization of an appropriate state of congruence between environmental and behavioral structures (Michelson 1970; Wicker 1972). The lack of such congruence in a particular setting constitutes a problem to be solved. Such an objective implies that neither system must conform to nor form the other. Rather, the objective is to realize an environment-behavior ensemble which fulfills the goals of the human setting under analysis within the constraints of the impinging external environment.

Any decision to intervene in a human setting is occasioned by a situation in which: 1) certain behaviors are occurring which are incompatible with the goals of the setting, and/or certain behaviors are not occurring which are required by the goals of the setting. Clearly, any design problem (as contrasted with a research problem) implies the need to change and maintain a behavior system in a new state, otherwise the setting would not be deemed problematic. A technical understanding of the processes of behavior change and maintenance are thus at the core of planned intervention at any level or scale. What all of this leads us to is a particular approach--a behavior-contingent, systems-oriented approach--to decision making. Such an approach will be outlined in the final section of this paper.

An Overview of the Crime Control Environment

The crime control environment can be seen to include the components of: community, enforcement, adjudication and corrections. The criminal justice system is truly a system in that events in one component or subcomponent affect the performance of others, and thus overall system outcomes, in discernable ways.* To realize significant, aggregate changes in criminal activity thus requires that we simultaneously address the entire continuum of processes comprising the criminal justice environment, and that we do this from a systems perspective. Such efforts are, of course, always underway and to the extent that these more comprehensive analyses are successful in capturing the system's interdependences, both justice and crime control are well served.

*If, for example, the enforcement component is highly effective in detecting and apprehending offenders only to have the courts, overloaded with cases, adopt a liberal bail or release policy, neither deterrent, incapacitative and rehabilitative functions of the system are consummated.

The development of a more comprehensive approach to policies and programs in--the design and management of an environmental support system for-- criminal justice, have also been hampered by the aforementioned "model muddle", i.e., the absence of an appropriate, consistent, unifying approach to the analysis of criminal behavior. The operant paradigm seems in many ways a reasonable basis for developing such a general approach.

In any event, given the above analysis of behavior change and maintenance, examination of the environment society has created to deal with criminal behavior reveals some fundamental difficulties. Space does not permit the development of a comprehensive, systematic operant analysis of the criminal justice environment, concentrating as it does on aspects of but one component, i.e., the community social/physical environment. Before moving to this component, however, let us look at the larger system of which it is an integral part.

That crime would soar in an increasingly affluent, relatively unoppressive, somewhat democratic society is in many ways, and in the context of conventional wisdom (which has guided policies to reduce crime) inexplicable. However, from an operant perspective, and upon examination of the environments which impinge on the crime-prone* individual, a more coherent picture of possible causation emerges. If criminal behaviors are, at least in large part, manifestations of environmental feedback, i.e., selective reinforcement, these seemingly aberrant behaviors become more understandable and the problem of altering them perhaps more tractable.

*"Crime-proneness" is used here simply to connote a state resulting from an individual's ontogeny in light of a particular social environment, e.g., family, peer group, as noted earlier in discussing the criminologist's perspective.

Present day social environments (products of changing community and family life patterns over the past couple of decades) produce young people highly vulnerable to certain kinds of environmental influences. Related to this is the realization that the criminal justice system must assume the major burden of regulating public behavior previously borne by the now less salient, supportive (of non-criminal activities) and integrated family and community milieu. In many urban settings young people have, thus, become increasingly anonymous except in the subculture of crime and violence. The criminal justice system which previously dealt with the exceptional deviant must now deal with a much larger population responding to a more salient and omnipresent set of (crime supporting) social reinforcers.

This shift of responsibility for surveillance and control of undesirable public behavior impacts on all components of the criminal justice system, but first on that of enforcement. The police could hardly perceive this incrementally shifting responsibility, nor were they inclined to reject it (since such a state of affairs is generally reinforcing). When they fail to perform at high levels in their greatly expanded role, however, they meet with inevitable hostility and non-cooperation from community members who themselves either will not or cannot regulate public behavior in the young adults. Enforcement officers thus become increasingly disengaged from the community and less responsive to the goals and contingencies operating therein. They came to succeed in their roles unevenly and with great difficulty simply because there were not enough, nor is it possible to provide enough well trained (or even badly trained) law enforcement officers to effectively monitor, detect and apprehend a significant proportion of the increasing number of criminal offenders operating in the absence of appropriate community environments (contingencies). The problem of enforcement, then, comes down to an inordinate responsibility for maintaining public behavior

emitted by an inordinantly large number of individuals. The problem is thus reduced to the technical one of maximizing available human and physical resources to monitor and apprehend criminal offenders--inventing new hardware and/or software to do so.

Under existing circumstances the probabilities of detection and apprehension are, in spite of significant per capita increases in law enforcement officers, quite low. That is, whatever the "root causes" or "deep seated impulses" to commit criminal acts, the environment exhibits a new set of cost-benefit or risk configurations, i.e., the probabilities of detection and apprehension are vastly altered. Even if an individual is ambivalent regarding criminal acts, the vicarious reinforcement operating on his/her peers--their successful participation in a life of crime--must make the enterprise seem all the more favorable and feasible.

The courts are, of course, caught up in the same flow of events. While the number of offenders apprehended is much smaller than the actual number of crimes committed, the number of individuals charged is greater simply because more crime is taking place. Thus the widely discussed deluge of cases emerges, and must be processed more rapidly leading to settlement via the inequitable and less incisive (with respect to relating crime to contingencies) method of plea bargaining.* The criminal court judge, now faced with many more offenders (than would have been the case had not the community control mechanisms broken down) becomes the major arbitrator in controlling public behavior. He may believe that corrections are intended to rehabilitate, but realizes that however undesirable an offender's behavior, it can only be made worse through

*Alternatively the offender is returned to the community on bail, or is indefinitely detained. In any case, the consequences are only remotely related (spatially and temporally) to the criminal behavior in question.

incarceration. His inclination is to send the offender back into the community, adding again to the law enforcement component's burden. The actual costs and benefits of crime have perhaps not changed except that the individual has learned first hand that even apprehension and conviction doesn't involve all that much cost. This provides in all likelihood a net positive reinforcement not only to the offender directly but vicariously to his peers. His propensity toward crime is strengthened; he is now operating on a very effective variable ratio reinforcement schedule, the most resilient to extinction.

If the offender is convicted and does happen to be incarcerated, the contingencies (linking consequences to his criminal behavior) appear all the more capricious. If he is black, for example, the chances of incarceration are far greater regardless of the crime (a decision probably based less on racism per se than on assessment of the behavior-supporting properties of the offender's community environment). It is well known that sentencing, i.e., whether to or how much, varies widely from judge to judge, from offender to offender and from offence to offence. Indeed the relationship between criminal behavior and its consequences can often be regarded as essentially random.

In short, environmental feedback via incarceration--the delivery of consequences is not systematically related to the behavior in question in that: 1) these are not spatially/temporally contiguous, 2) their intensity is not consistently related to a particular behavior and 3) they are not predicated on a scientific assessment of the offender's behavioral propensities. This state of affairs in the adjudication component not only raises serious questions of equity, but is in many ways antithetical to principles guiding a technical analysis of environment-behavior relations.

Once imprisoned, the offender comes under the influence of a more powerful environment, one organized in a manner even less relevant to viable behavioral

objectives. That is, he is subject to behavior controlling and shaping contingencies related not to crime-free behaviors in the free world but those related to life within the prison. The inmate must if he is to: 1) survive and, 2) get out, maximize his performance under the influence of two divergent systems of contingencies: those of the inmate culture, and those of the corrections bureaucracy (including the parole board). The contingencies operating in the former are fairly incisive; those of the latter, thanks to the "model muddle", are less so. In any event his participation in work, training, education or other "rehabilitation" programs is nearly always directed toward obtaining early release rather than developing appropriate free world repertoires, i.e., these programs are coercive, not facilitative (Morris 1974). Moreover, values underlying such programs are usually those of the middle class, generally alien to the participating offender. For these and other reasons carefully reviewed by Sommer (1976) and others, the imprisoned individual, whatever the influence of his environmental history, is subjected to a milieu in which his behavioral objectives are soon subordinated to the single goal(s) of release and/or serving "easy time."

In summary, the criminal justice system has unexpectedly assumed major responsibilities for the monitoring and control of public behavior which previously rested in the family and community environment. The contingencies of reinforcement operating in this system as it has evolved, tend in effect to increase rather than decrease the probabilities of criminal behaviors in persons with any inclination toward crime. The picture which emerges is a kind of deviation amplifying (positive feedback) system (Maruyama 1963) in which matters can only become worse unless an appropriate intervention is effected. The "initial kick", characteristics of such phenomena, can be identified as the deterioration of community interdependencies, together with the exponential

increase of young people requiring socialization in the sixties. Once the system begins to thus operate the incidence of crime is bound to increase. The task of environmental planning, design and management is that of transforming this deviation amplifying (positive feedback) system into a deviation countering system. This transformation requires a careful analysis of the contingencies of reinforcement operating on the individual offender (or potential offender) in all components of the crime control environment. The CPTED concept addresses aspects of one of these components, i.e., the community social/physical environment.

The CPTED Concept from an Operant Perspective

The CPTED concept is focused upon the interaction between human behavior and the "built environment" (includes those elements both natural and shaped by man), as is defensible space. By way of contrast, however, CPTED principles treat both the proper design and the effective use of the environment. The CPTED approach generally involves an integration of strategies selected from existing and new physical and urban design, community organization and citizen action (social), management, and law enforcement crime prevention concepts. (Westinghouse National Issues Center 1977).

Among those who have addressed issues of crime prevention through environmental design, there has been a natural focus on social control mechanisms and their translation into parameters of physical (spatial) organizations, i.e.

The CPTED approach primarily seeks to deter or prevent crimes and their attendant fears within a specifically defined environment by manipulating variables that are uniquely related to the environment itself. The approach does not attempt to develop crime prevention solutions in a broader universe of human behavior. It does not emphasize corrective preventions action which involves elimination of causes, factors, or motivations before the criminal behavior has actually taken place. Rather, CPTED is principally a mechanical crime prevention approach that is directed toward reducing opportunity and increasing risk. (Westinghouse National Issues Center, 1977.)

Essentially strategies of intervention documented in the current CPTED literature include those of: access control, surveillance, activity support and motivation reinforcement (Tien, Reppetto and Hanes 1976). Neither the CPTED concept generally, nor this taxonomy of strategies emerged from an

operant behavioral analysis per se. However, in order to illuminate the relevance of the principles and processes discussed earlier to the CPTED approach these strategies will be reviewed from an operant perspective.* Following this review, a purely operant approach to CPTED will be briefly outlined.

ACCESS CONTROL: This refers to strategies intended to keep potential offenders out of a particular locale. When the locale is private property, the strategies can be mainly technological in nature. That is, the area may be made impenetrable to all but those who have, e.g., the right key, the proper fingerprints, identification, or password. Target hardening is the term used to describe a design strategy essentially directed toward increasing security via physical technology.

The side-effects of target hardening, however, impact on the residents of the fortification, whose own ingress and egress is cumbersome, and who must live with constant reminders of vulnerability. Further, much of the space susceptible to criminal violation is not private, but public property. As such, it is open to potential offenders, and target hardening is of limited utility. Instead, attempts are generally made to discourage criminal behavior through cues which signify that the area is protected.

The objective of access control strategies from an operant perspective are to: 1) physically constrain the emission of certain criminal behaviors, 2) extinguish certain criminal behaviors and 3) effect avoidance behaviors (away from the "target"). Let us look at some strategies of environmental design and management to effect these objectives:

*In reviewing these there will be no special attempt to introduce more novel operant-based strategies, but rather to place those discussed in the literature in an operant context.

Objective: Physically constrain the emission of criminal behaviors and/or induce perception of invulnerability.

Strategies:

- target hardening, e.g., gates, locked doors, barred windows, passwords, doorman.
- provide discriminative stimuli communicating inpenetrability of the setting in question. In effect physical artifacts provided to constrain also provide discriminative stimuli depicting their function but elements [stimuli] beyond these physically functional ones should also be considered.

Objective: Extinguish criminal behaviors.

Strategies:

- provide no positive consequences for criminal behavior, e.g., locked money boxes on buses and in service stations, frequent removal of money, "tainting" the target good by indelible marking or registration, (thus reducing their value), no cash payment for goods (i.e. elimination of generalized reinforcers).
- provide discriminative stimuli communicating the inaccessibility of positive consequences, e.g., signs communicating to potential assailants that attendant possesses no key for depository or that there is no cash (or drugs) on hand.

Objective: Effect avoidance behaviors (away from the "target").

Strategies:

- arrange the environment such that criminal behaviors will produce immediate punishing consequences, e.g., alarm systems, swift apprehension tactics.
- provide discriminative stimuli communicating the (apparent) inevitability of detection and punishments, e.g., notices, conspicuous display of alarm systems, (a-periodic) patrols.

SURVEILLANCE: Surveillance strategies operate not only to keep intruders out, but to keep them under observation. These ostensibly function to increase the perceived risk to offenders, as well as the actual risk if the observers are willing to respond to attempted transgressions. Members of a community are more likely to engage in surveillance behaviors when they came to have a sense of territoriality with respect to the area of observation.

Organized surveillance is typically enacted by police patrol, and its effectiveness is tempered by the technical inability of patrol officers to observe an entire area at the same time. The effectiveness is enhanced, however, by the conspicuousness of patrol accoutrements, e.g., police cars, motorcycles, uniformed officers, which embody a clear statement to potential offenders that deviance will not be brooked. The consequences of performing a criminal act in clear view of law enforcement personnel are quite predictable, and in the presence of observing residents highly probable. Natural surveillance refers to resident alertness to intruders, which can be facilitated by making crime-prone areas easily visible to legitimate inhabitants.

The behavioral objectives of surveillance strategies from an operant perspective are to: 1) reduce the probabilities of criminal behaviors (via the provision of immediate punishing consequences), 2) effect avoidance behaviors on the part of potential predators, 3) induce the perception (on the part of potential predators) of high levels of surveillance and 4) increase probabilities of surveillance behaviors on the part of non-offenders.

Objective: Reduce the probabilities of criminal behavior.

Strategies: •provide instant punishing consequences for criminal behaviors*, e.g., social disapproval, physical confrontation, apprehension.

•maximize visual access (of potential offenders) for surveyors, e.g., of stairways and corridors, fenestration to provide visual access into and out of buildings, arrange living units according to a maximum mutual surveillance criterion, provide adequate lighting in crime-prone areas.

*Criminal behaviors include those leading to or related to consummation of a criminal act as well as the act itself, in which case consequences less salient than apprehension should be provided for these related behaviors--essentially a strategy of public behavior regulation generally.

- maximize number of surveyers via spatial organization (see below).
- arrange effective communication channels to, and instant response mechanisms for, enforcement responses, e.g., crime hot line.
- arrange interim restraint strategies (before enforcement officers can respond).

Objective: Effect avoidance behaviors (on the part of potential predators).

Strategies: •provide instantaneous punishing consequences for criminal behaviors (see above).

- maximize communication of punishing consequences to potential offenders to effect vicarious learning (social modeling), e.g., make punishing consequences highly public, provide good media coverage, communicate such events via private networks.

Objective: Induce perception (on the part of potential predators) of high levels of surveillance.

Strategies: •provide discriminative stimuli communicating high surveillance capabilities, e.g., electronic monitors (which may or may not be active), surveillance mirrors, maximize visual access and interaction (of potential predators) with potential surveyers, signs regarding monitoring capabilities, alarms, frequent highly visible patrols by enforcement officers and others.

Objective: Increase numbers of potential surveyers and surveillance behaviors.

Strategies: •see below.

ACTIVITY SUPPORT: This refers to strategies effected through organization (design) and management of the built environment which reduce the social and physical gaps which facilitate criminal acts. The physical environment impacts on human behavior in two ways. It directly constrains physical movement and elicits certain responses through stimulus control (when stimuli became effective or meaningful via discriminative learning). The physical environment also influences human

behavior (indirectly as it were) via its constraints on the social environment which in turn impacts directly on human behavior.

Predatory acts are generally consummated only when the physical environment exhibits certain characteristics, or when such characteristics are perceived to exist on the part of a predator, i.e., when the predator has access to "target" goods and victims and when the risk of detection and apprehension reach certain minimum thresholds (yet to be completely defined empirically). Also the physical environment provides a context which facilitates social interaction and group activities by the provision of physical accommodation, i.e., appropriate quantities and qualities of space, and contingencies of reinforcement which elicit interpersonal (group) behaviors. To the extent that the built environment embodies variables which are effective in constraining and facilitating these behavioral states the manipulation of these is what constitutes strategies of activity support.

The behavioral objectives of activity support strategies from an operant perspective are, through spatial organization and management, to 1) increase the probabilities of surveillance behaviors on the part of non-offenders, 2) induce the perception (on the part of potential offenders) of extensive surveillance (by others), 3) increase interpersonal behaviors/social cohesion of non-offenders. Environmental design and management strategies to effect these states include the following.

Objective: Increase the probabilities of surveillance behaviors (of non-offenders).

Strategies: maximize visual access to crime-prone areas, e.g., see above.
constrain physical movement so as to maintain appropriate densities of people, e.g., circulation corridors, public spaces for various functions.

Objective: Induce perception of extensive surveillance opportunities.

Strategies: ·provide discriminative stimuli which communicate high levels of activity and high probabilities of surveillance and detection of criminal acts, e.g., see above.

Objective: Increase opportunities for and probabilities of inter-personal group behavior.

Strategies: ·provide appropriate (quantitative and qualitative) spatial configurations for group activities, e.g., meeting places, circulation accommodations.

·arrange (spatial) contingencies of reinforcement for group activities, e.g., for public recreation, services, and social functions known to be reinforcing to the population.

·provide (and shape up) discriminative stimuli to elicit social behaviors on the part of residents, e.g., symbols of community cohesion and group objectives.

MOTIVATION REINFORCEMENT: This refers to strategies implemented to influence both offenders and community residents so as to channel the energies of the former into constructive activities, and increase the territoriality and social cohesion of the latter. Central to both activity support and community motivation reinforcement is the induction of territorial concern. Territorial concern typically extends within one family across the physical and social unit of the family. When one member of the family is threatened, other family members are ready to come to their defense. At least this is what is dictated by conventional wisdom.

The problem is to expand residents' sense of territoriality beyond their own dwelling and kin to encompass public and semi-public surroundings and neighbors. Strategies to increase effective use of the environment may operate to enhance community territoriality by giving inhabitants a clear stake in the integrity of the area. That is, if semi-public spaces are regularly used for sports, gardening, sunbathing, laundering, car-washing,

picnicing, etc., the users will have an investment in such places, and, therefore, will experience aversive consequences if the spaces are impinged upon by persons with criminal intent.

Furthermore, regular use of such areas is likely to yield social interaction among users, which will increase the probability of bonds being formed to the extent that a neighbor's misfortune may be perceived as one's own. It is through the development of an individual inhabitant's stake in the community that territoriality and social cohesion is generally predicted to grow. Given a sense of responsibility for the community, the effectiveness of surveillance strategies will be greatly enhanced. Moreover, the need for these may be diminished since the realization of such forms of social interdependence tends to reestablish the community as a more effective socializing, behavior-regulating mechanism generally, thus reducing the propensity for young adults to engage in criminal activity.

The behavioral objectives of community motivation reinforcement from an operant perspective, then, are to: 1) increase interpersonal behaviors (as an empirical index of social interdependence/cohesion), 2) increase territorial (and thus surveillance) behaviors in public and semi-public areas, and 3) increase the probabilities of non-criminal behaviors in potential offenders.

Objective: Increase social interdependence/social cohesion.

Strategies:

- effect community organization to facilitate group decision-making, e.g., neighborhood organizations, interest groups.
- arrange contingencies of reinforcement to effect group behaviors, e.g., clubs, major service projects (community run half-way houses), day care.

- provide facilities for community-wide use (which increase probabilities of interpersonal behaviors), e.g., recreation facilities, laundries, day care centers, security office (maintenance as per below).
- provide (shape up) discriminative stimuli to elicit community behaviors, e.g., symbols of community organization, its objectives and functions.

Objective: Increase territorial (and thus surveillance) behaviors in public and semi-public areas.

- Strategies:
- increase the salience of community-wide consequences for crimes perpetrated on individual members or segments, e.g., communicate incidents to all members, group insurance rates.
 - assign public and semi-public facilities to various members and segments on a rotating basis, (thus effecting a perception of "ownership" of the community-wide domain).
 - assign maintenance responsibilities for public and semi-public facilities (and reinforce maintenance behaviors via the favorable consequences derived from their use--as per above), e.g., recreation, service (day care, laundry, half-way house, security office).

Objective: Increase non-criminal behaviors of potential offenders.

- Strategies:
- arrange contingencies of reinforcement which increase non-criminal behaviors, e.g., work or business opportunities, remunerated service responsibilities (half-way houses, security, day care), clubs.
 - arrange contingencies to increase community participatory or integrative behaviors on the part of potential offenders, e.g., decision-making responsibilities, consultation, service responsibilities (as per above).

Of these strategies of intervention, community motivation reinforcement appears the most appropriate for introducing more novel operant strategies via the implementation of new contingencies of reinforcement to effect increased levels of social interaction/cohesion. This mode of dealing with crime is appealing for several reasons. First of all it tends to (re)establish vital aspects of the community environment, namely those influencing the socialization process and those regulating public behavior generally. Secondly, this is an approach which seeks to reach potential offenders and redirect their behavior

via positive reinforcement procedures, an approach likely to effect a more permanent solution than one based on aversive control.

As noted earlier the above taxonomy of strategies to control criminal behavior is that emerging in the CPTED literature and doesn't necessarily reflect that which would emerge from a purely operant approach. This accounts, in part, for the considerable overlap among the various strategies as depicted. What appears to be reflected in the CPTED approach is a taxonomy based on environmental means of influencing criminal behaviors, while an operant approach would seek a taxonomy based on behavioral objectives. Development of an operant-based treatment/intervention package would be developed with such questions as:

What are the behavioral objectives?

Whose behavior is the target of change?

What are the behaviors to be changed?

What methods are available for changing these behaviors?

What are the most effective strategies for changing these behaviors?

A response to these questions yields a format of CPTED strategies somewhat as noted in Figure Three.

Figure Three about here

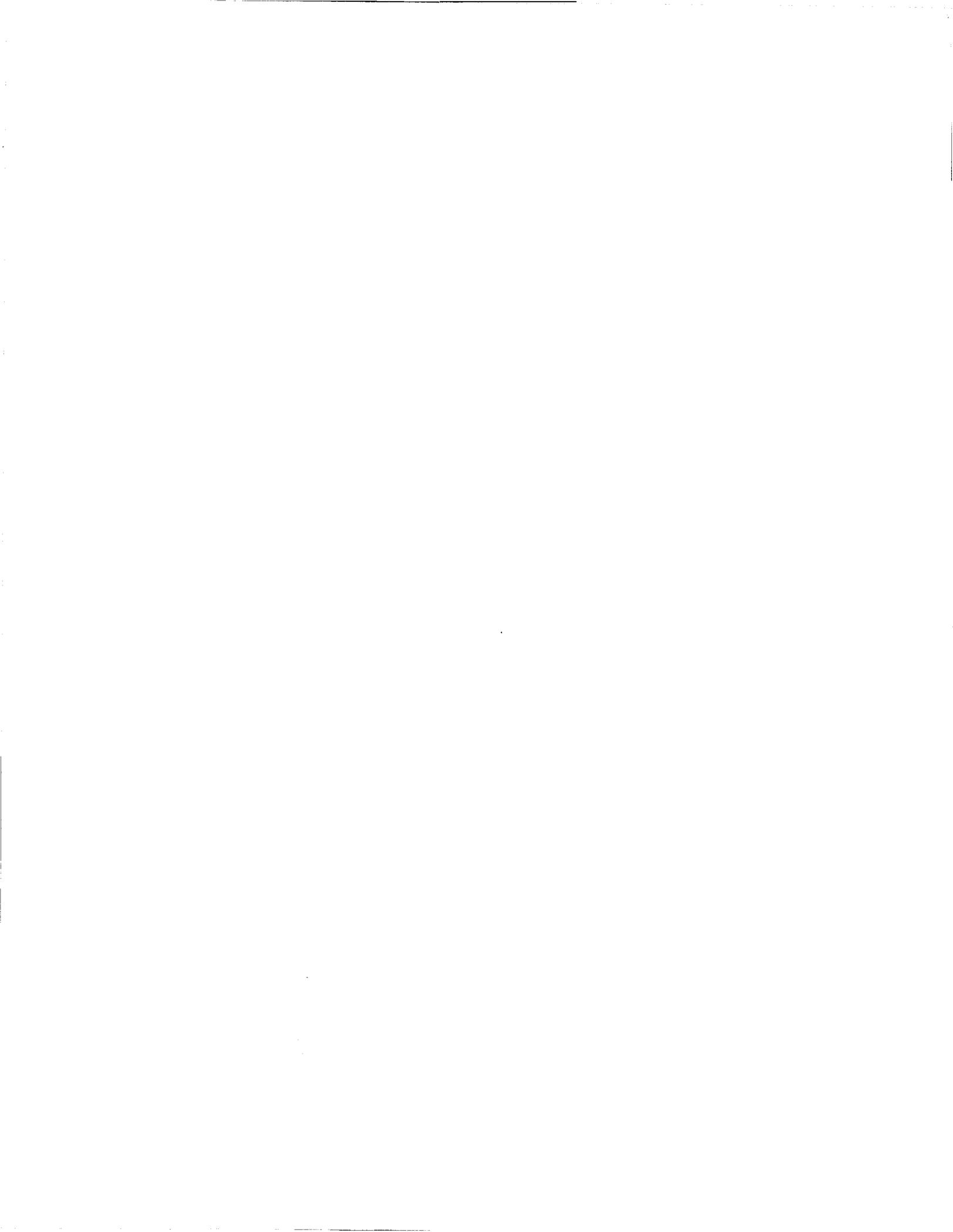
In the area of crime prevention there has been a natural focus on aversive control* of behavior, i.e., punishment or threat of punishment. This is almost

*Jeffery (1971) has developed a rather extensive operant analysis of the benefits and costs, i.e., the reinforcing and punishing consequences, operating in urban environments. His conclusion is that the aversive consequences of criminal behavior, e.g., punishment via the administration of justice systems, are considerably more remote than the immediate positive consequences, e.g., material gain, admiration of peers. His recommendation in this regard is that the environment should be reorganized to facilitate more immediate aversive feedback (punishment), and this feedback should occur with increased probability where a criminal act has occurred. In such circumstances the risks would obviously outweigh the gains.

unavoidable for reasons beyond retribution (except in the corrections component where punishment per se serves little rehabilitative purpose and where environmental control can be established--Studer 1972). But it should be remembered that in open-ended situations such as a complex urban setting the crime-prone individual may simply redirect his behavior toward an aspect of the environment where aversive consequences are less likely. The criminal behavior is said to be displaced (Tien, Reppeto and Hanes 1976) via avoidance behavior. There is little that can be done about this except to deploy strategies over as wide an area as possible, while concentrating resources on high probability crime sites (adjusting these dynamically as such concentrations shift spatially). Also, strategies of aversive control should always operate in tandem with those of positive control (reinforcement of behavior is compatible with crime). Again, the latter class of strategies offers the more permanent solution.

In effecting strategies of intervention such as those suggest, the various principles and processes discussed earlier require careful consideration (i.e., the power of an operant analysis lies in attention to detail). It should be remembered, for example, that behavior, including avoidance behavior, can be most effectively and economically maintained via the intermittent presentation of consequences (punishers and reinforcers via variable ratio or variable interval schedules). When resources (.e.g, man, power, money) are limited, as they generally are for this purpose, this principle (intermittent presentation of consequences) is an important one. A-periodic schedules of punishing events increase uncertainty and thus anxiety on the part of predators regarding detection.* On the other hand immediacy

*The desirable state of affairs, of course, is one wherein the predictability or uncertainty regarding the onset of a criminal act is reduced for resident non-offenders (thus reducing anxiety regarding crime, a more important stressor than fear), while increasing somewhat the uncertainty regarding the onset of punishing consequences on the part of offenders.



BEHAVIORAL OBJECTIVES(S)	TARGET POPULATION	TARGET BEHAVIORS	BEHAVIOR CHANGE METHOD		ENVIRONMENTAL INTERVENTION STRATEGY
			C.M.*	S.C. CM & SC	
Effect behaviors in the setting's population to potentiate a reduction in the incidence and fear of violent crime, e.g.,	Offenders, e.g., --burglars --muggers --rapists --vandals	Offenders, e.g., --burglary ·identify target setting ·approach target goods ·enter ·take possession ·exit ·dispose of target goods			See pp. 31-38 for example intervention strategies.
--decrease the frequency of/extinguish criminal behaviors.	Non-offenders, e.g., --victims (potential) ·residential -owners -renters -guests ·commercial -shopkeepers -employers -shoppers ·institutions ·students ·others -non-resident passers-by -visitors	--mugging ·identify target victim ·approach ·accost ·consummate ·escape			
--increase the frequency of/shape-up behaviors (of non-offenders) related to social cohesion/territoriality/surveillance.	--surveyors ·residential -owners -visitors -guests ·commercial -shopkeepers -employees -shoppers ·other -non-resident passers-by -visitors	--non-criminal ·work ·recreate ·learn (educate) ·socialize ·render service			
--increase the frequency of/shape-up behaviors (of offenders) incompatible with violent crime.		Non-offenders, e.g., --induce social cohesion/territoriality/surveillance ·group decision-making ·social interaction ·group task performance ·defend space ·monitor space			

C.M.=Contingency Management
S.C.=Stimulation Control

ASPECTS OF AN OPERANT-BASED CPTED TAXONOMY

Figure Three



of consequences when a criminal behavior has actually been emitted is also an important principle of behavior change and maintenance.

Finally, it is important to note that really effective and innovative solutions cannot be preconceived and externally imposed. The energy for social/behavioral change must come from the population affected. For both technical and ethical reasons their reinforcement potential (needs, desires), and most of all, their behavioral goals must be assessed in context. These can only be ascertained via appropriate empirical methods grounded in an appropriate theoretical framework.*

It would be unforgivably naive to assume that reorganization of urban spatial (physical) variables alone can significantly affect crime. Clearly criminal behavior is maintained via a complexity of contingencies operating in a number of environments, e.g., economic, social, political. The need for more effective and appropriate environmental feedback via reorganization of the larger crime control environmental system is manifest. Also, we should implement strategies both technological and social to maximize monitoring capabilities; and it makes good sense to create urban spatial systems which reduce opportunities for criminal behavior. It makes even more sense if this same spatial arrangement also facilitates the attainment of other community goals, e.g., more effective and rewarding social interactions. Urban settings must, however, meet a number of objectives beyond prevention of crime, and the prospect of "defensive cities" (Gold, 1970) with crime control as their principal function seems an untenable state of affairs. We must at the very least see modification of criminal behavior in the context of larger community goals--must seek more effective strategies of environmental-behavioral planning, design and management generally. In the following and final section let us turn to this issue.

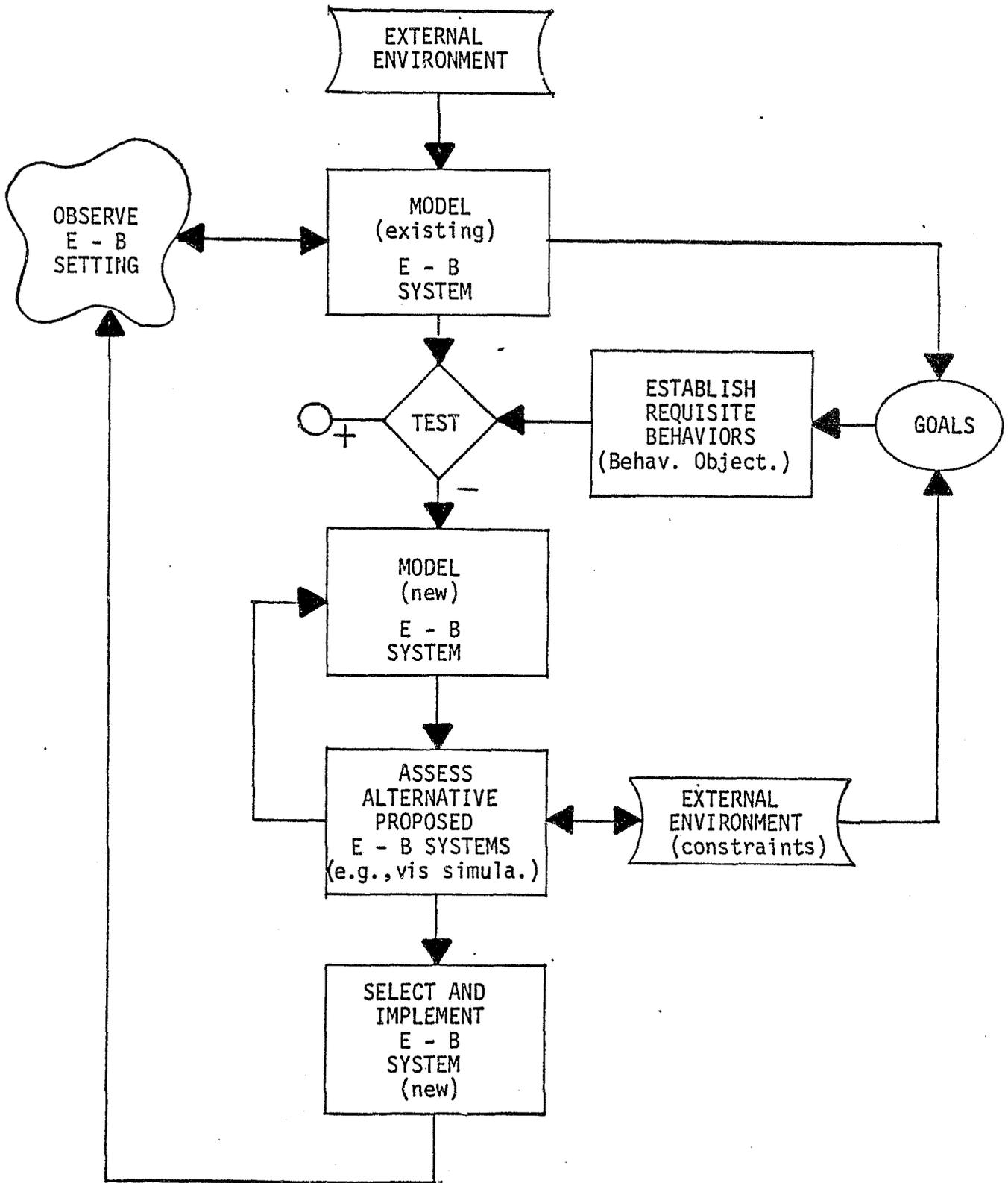
* See Landy's accompanying article.

A Behavior-Based Approach to Environmental Planning, Design and Management

An understanding of the processes of behavior change are at the core of planned intervention at any level or scale. What this realization leads us to is a particular approach--a behavior-contingent approach--to decision-making. Arguments for an appropriate strategy have been developed elsewhere (Studer 1966, 1970, 1971) and the approach is depicted in Figure Four. Let us now briefly review some procedural issues related to each of the elements of this decision-making format.

Figure Four about here

OBSERVATION OF THE ENVIRONMENT-BEHAVIOR SETTING: When contemplating intervention in a setting of problematic concern it is, of course, necessary to identify the boundaries of one's observations, e.g., the relevant: population, physical context, general class of problematic behaviors. Beyond this we cannot determine a priori the precise nature of the behavioral problem, the rate of responses, which aspects of the behavior's responses are under the control of which environment consequences, nor the contingencies linking these. Identifying such variables, e.g., the contingencies of reinforcement, in naturally occurring human settings is essentially an art, requiring experience and patience since the controlling conditions nearly always operate subtly and are often found to be counter-intuitive. This



BEHAVIOR-BASED ENVIRONMENTAL DECISION-MAKING PROCESS

Figure Four



has led many casual observers to conclude that the (behavior) "system" observed is merely a collection of individuals pursuing their own needs, feelings and purposes. On one level this is perhaps the case, but on another a system of contingencies is surely maintaining the interactions within the social/physical setting. The unruly behavior of a child in a classroom is often under the control of consequences provided by the teacher in ways sufficiently subtle to require a trained observer to isolate the actual contingencies (see, e.g., Neisworth 1976). In any event the purpose of initial observation of the setting is to identify the relevant: behaviors, consequences and the contingencies linking these.

MODELING THE ENVIRONMENT-BEHAVIOR SYSTEM: In order to make a problem situation tractable, and observations of it meaningful, it is necessary to identify precisely which variables (e.g., events, environmental conditions) are relevant in maintaining the existing problematic behaviors. "Modeling," as a descriptor of this aspect of the process, sounds a bit pretentious and formidable. Use of the term does not necessarily imply formulation of a formal, mathematical model, but the need to conceptualize the system of contingencies maintaining the behavior in question. Once the system of relevant environment-behavior relationships has been conceptualized the rates of responding* and the schedule of consequences should be monitored and assessed (hopefully quantified).

*In the case of predatory, person-to-person crime, it is obviously not merely the rate of actual criminal acts which require assessment, but behaviors (on the part of both potential victims and predators) probabilistically related to such events (see Figure Three).

ESTABLISHING GOALS AND SPECIFYING REQUISITE BEHAVIORS: Identifying the goals of a collection of individuals participating in a setting, is a complex subject, the detailed discussion of which is beyond the scope of this analysis. It should be noted, however, that the failure of many programs of behavioral intervention can be attributed to the failure of interventionists to properly assess the goal structure of affected populations, (not to mention their "motivations," as discussed by Landy). In programs of intervention it is essential that: 1) the goals and objectives of a particular program be consistent and integral with other goals of the setting, 2) the goals be established by the population affected (not by the intervener), and 3) the goals should be defined in terms which admit operationalization in units of behavior. Thus, the specification of requisite behaviors grow directly out of the goals established by the population affected. For example, the goal: "reduce predatory crime" requires further specification in terms of empirically accessible behavioral indices, i.e., the behavioral manifestations of such a state. Otherwise the problem remains somewhat intractable with regard to environmental organization--the evaluation of its effectiveness before and after intervention.*

SPECIFICATION OF THE BEHAVIOR CHANGE PROBLEM: In order to actually define the behavior problem to be solved, it is necessary to compare existing behavior

*This is not to say that attitudinal assessment is not an important parallel source of information and evaluation of effectiveness, only that direct measurement of behavior--its specification and change--is the fundamental empirical datum.

states to those considered requisite to meet the goals of the setting in question. It is the disparity between existing and required behaviors (their form and rates) which constitutes the problem to be solved through environmental reorganization (i.e., a new system of contingencies). In short, which existing behaviors should be extinguished, which of them should be strengthened or altered, and which new behavioral forms should be developed?

SPECIFYING A NEW ENVIRONMENT-BEHAVIOR SYSTEM: Having defined the specific behavioral problem, the next task is to specify the environment required to effect these new states. This amounts to conceptualizing a "model" describing the new system of contingencies predicted or hypothesized to produce the requisite state of behavioral affairs. Which is to say that we must develop a conceptualization of the basic conditions required, i.e., environmental elements, states and relationships, before these can be realized in real-world settings. This conceptualization or model is based on conventional wisdom, experience and a general theory (or theories) of environment-behavior systems, e.g., the operant paradigm described above. Essentially this model of the required system asserts that: "if certain environmental conditions are effected, then the requisite behaviors will emerge." It is a precise statement of the environmental problem to be solved.

ASSESSMENT OF ALTERNATIVE PROPOSED SOLUTIONS: There are obviously no algorithms for solving this class of problems, and the direct implementation of untested models of complex environmental interventions carries considerable

social, economic, political risk, at least in on-going community settings. What is required, then, is the pretesting of various proposed concrete solutions. It is at this point that various real-world constraints (e.g., economic, physical, social, political) impinging on the proposed solution come into play (see "External Environment"). The development and assessment of various alternative environmental arrangements, as well as the selection of that particular configuration deemed most effective in meeting the goals of the setting (within the constraints operating thereon), involves essentially a heuristic (design) process. There are, however, a number of decision-making techniques available to facilitate this process. (e.g., cost-benefit analysis, network analysis). Of particular promise in developing and assessing alternative environmental states are the techniques of simulation (see, e.g., Studer and Hobson 1973; Everett, Studer and Douglas, in press).

One result of assessing the impact of various configurations (e.g., on the external environment) is the need to revise the goals, and thus the behavioral objectives, of the enterprise; for example, if no politically or economically feasible solution can be found. Another result of this exploration may be the need to revise (refine or alter) the environment-behavior model formulated earlier. In any event, the various alternative environment-behavior configurations must be evaluated in terms of the fit between probable behavioral outcomes of these and the requisite behaviors specified earlier.

SELECTION AND IMPLEMENTATION OF A NEW ENVIRONMENTAL ARRANGEMENT:

After having refined, pretested and compared various environmental arrangements (with respect to predicted behavioral outcomes) one is

selected and implemented. Implementation is simply the act of placing the selected environmental arrangement (new contingency network) in the actual setting. In spite of the above processes to refine and pretest the selected solution, this implementation is best viewed as the realization of an experiment to field test a particular solution empirically. That is, the original processes of observation, modeling and assessing new behavioral states (new baseline states) are then executed (see top of Figure Two), perhaps calling for iteratively proceeding through the entire process until resultant and requisite behaviors approach consonance.

Implementation of such programs of environmental-behavior intervention in communities is indeed a complex undertaking considering available tools and knowledge. The task is made even more difficult, however, when one realizes that such systems are not finite-state, but, like all living (open) systems, subject to constant change. Areas of variability include: 1) changes in the setting's goal structure, 2) changes in exogenous constraints, ("External Environment:), 3) changes in various internal environments, e.g., political, economic, social, and 4) changes in the human participants, e.g., states of deprivation, adaptation, learning. A change in any one of these can bring about dissonance in the environment-behavior setting and the need for its reprogramming.

Considering the variable nature of human systems, together with the uncertainties involved in behavioral predictions generally, it is clear that a solution is not really a solution at all but an hypothesis. Implemented environment-behavior systems, then, should be viewed quite literally as on-going experiments*. The above decision-making process

*This argument has also been developed from a different perspective by several social scientists, e.g., Campbell, 1972; Rivlin 1970.

is thus appropriately seen as iterative--a dynamic on-going experiment designed to move an ensemble toward consonance in response to changing goals and controlling conditions.

Although clearly based on the objective of behavior change and maintenance, the above decision-making format includes operational elements which lie outside the literature or current programs in behavior modification, e.g., systematic (pluralistic) goals development, system modeling (both existing and requisite states), system pretesting, e.g., via simulation experiments. The elements of this revised formulation are intended to respond explicitly to the criticisms of behavior modification programs noted previously, and a decision-making format such as this is recommended wherein a more comprehensive intervention strategy is contemplated.

REFERENCES

- Ashby, E. "Can education be machine made?" New Scientist, February 1967.
- Bandura, A. Principles of Behavior Modification. New York: Holt, Rinehart and Winston, 1969.
- Campbell, Donald T. "Methods for the Experimenting Society," American Psychologist, 1972.
- Chomsky, N. Review of Skinner's Verbal Behavior in Language, 1959, 35, 26-58.
- Duffee, D. Correctional Policy and Prison Organization. New York: John Wiley, 1975.
- Everett, P., R. G. Studer and T. J. Douglas. "Gaming Simulation for Pretesting Operant Manipulations: an Urban Transportation Example." American Journal of Community Psychology, in press.
- Gold, R. "Urban Violence and Contemporary Defensive Cities." Journal of the American Institute of Planners, XLI, 5, 1970.
- Holland, J. G. "Behavior Modification for Prisoners, Patients and Other People as a Prescription for the Planned Society." Paper presented at the Eastern Psychological Association Meetings, Philadelphia, PA April 1974.
- Honig, W. (Ed.) Operant Behavior: Areas of Research and Application. New York: Appleton-Century-Crofts, 1966.
- Jeffrey, R. Crime Prevention Through Environmental Design. Beverly Hills: Sage, 1971.
- Kazdin, A. E. "Extensions of Reinforcement Techniques to Socially and Environmentally Relevant Behaviors." In M. Hersen et al. (Eds.), Progress in Behavior Modification. New York: Academic Press, in press.
- Krutch, J.W. The Measure of Man. Indianapolis: Bobbs-Merrill, 1953.
- Maruyama, M. "The Second Cybernetics: Deviation-Amplifying Mutual Causal Processes." American Scientist, 51, 1963, 164-179.
- Michelson, W. Man and His Urban Environment. Reading: Addison-Wesley, 1970.
- Morris, N. The Future of Imprisonment. Chicago: University of Chicago Press,
- Neisworth, J.T., Deno, S. L., & Jenkins, J. R. Student Motivation and Classroom Management. Lemont: Behavior Techniques, 1973.
- Reynolds, G. S. A Primer of Operant Conditioning. Glenview: Scott, Foresman and Company, 1968.
- Rivlin, A. Systematic Thinking for Social Action. 1970.

- Skinner, B. F. Science and Human Behavior. New York: MacMillan, 1953.
- Skinner, B. F. The Technology of Teaching. New York: Appleton-Century-Crofts, 1968.
- Sommer, R. The End of Imprisonment. New York: Oxford University Press, 1976.
- Studer, R. G. "The Dynamics of Behavior-Contingent Physical Systems." In H. Proshansky, et al. (Eds.) Environmental Psychology: Man and His Physical Setting. New York: Holt, Rinehart and Winston, 1970.
- Studer, R. G. "Human Systems Design and the Management of Change." In General Systems, XVI, pp. 131-143, 1971.
- Studer, R. G. "Man-Environment Relations: Discovery or Design." In W. Preiser (Ed.), Environmental Design Research, Vol. II. Stroudsburg: Dowden, Hutchinson and Ross, Inc., 1973.
- Studer, R. G. "Urban Design, Learning Theory and Behavior Modification." American Association for the Advancement of Sciences Meeting Symposium on Crime Prevention: Heredity and Environment Revisited, December 1972.
- Studer, R. G. and R. H. Hobson. "Simulation of Human Learning in Urban Movement Systems." In W. Preiser (Ed.) Environmental Design Research, Vol. II. Stroudsburg: Dowden, Hutchinson and Ross, Inc., 1973.
- Studer, R. G. and D. Stea. "Environmental Design and Human Behavior." In Journal of Social Issues, Vol. 22, No. 4, October 1966.
- Tien, J. M., T. A. Reppetto and L. S. Hanes. Elements of Crime Prevention Through Environmental Design. Arlington, VA: Westinghouse Electric Corp., 1976.
- Westinghouse National Issues Center. The CPTED Program at the Westinghouse National Issues Center, 1977. (Unpublished Overview.)
- Wicker, A. "Processes Which Mediate Behavior-Environment Congruence," In Behavioral Science, Vol. 17, No. 3, 1972.
- Willems, E. "Behavior technology and behavioral ecology." Journal of Applied Behavior Analysis, 7, 1974, 151-165.
- Wilson, J. B. Thinking About Crime. New York: Basic Books, 1975.
- Sutherland, E. H. and D. R. Cressy. Principles of Criminology, Philadelphia: J.B. Lippincott, 1966.



END