Why do some blocks have more crime, or their residents have higher fear levels, than other blocks? In an effort to answer this question we proposed a model that incorporated physical defensible space features, local social ties, and territorial functioning. The model was tested using data from a multistage, stratified sample of 687 Baltimore households on 63 blocks. At each household, surveys were completed and on-site physical features were photographed and subsequently rated. Records of police activity on each block were also obtained. Our model explained significant portions of crimes of violence to persons (18%) and block fear (37%). It was also able to predict a significant amount (13%) of the variation in individual-level fear. At the block level: defensible space features dampened crime and fear but not as strongly as expected; and local social ties dampened crime and fear directly, and indirectly via an enhancement of territorial functioning. A model predicting individual fear levels, controlling for block context, was also supported. Our successful modeling of block dynamics suggests that these entities may profitably be treated as small-scale social units or groups. The pattern of findings has also confirmed suggestions made by others that physical factors alone cannot be relied on to preserve local order and feelings of security. Finally, the block-level linkages between local social ties and territorial attitudes clarify how territorial attitudes reflect, and may contribute to, the development of group-based norms regarding appropriate behaviors in on-block settings.

As crime in the urban residential environment has mounted in the last twenty years or so, so has concern about crime control. Ironically, this

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increasing concern has been paralleled by an increasingly pessimistic view about the realistic possibilities of controlling crime through policing (e.g., Larson, 1975). Consequently, attention has turned to possible nonpolice methods of controlling crime. These methods fell, broadly speaking, into two groups. The first group is community crime prevention efforts (e.g., Podolefsky and DuBow, 1981; Podolefsky, 1983; Lavarakas, 1982; Taylor and Shumaker, 1982) in which citizens are mobilized for the purpose of being “the eyes and ears” of the police, watching out for neighbors and their property, and taking appropriate action where necessary. A second group of efforts has centered around understanding the “naturally” varying physical, social, and socioeconomic features that are associated with high or low crime.

The latter area of inquiry spans a sizable literature in the areas of criminology, economics, geography, planning, psychology, and sociology. (See Harries, 1979, Taylor, 1982, 1983, for reviews.) Of particular interest in this area are the roles played by site level or small-area level physical features, which, if they are relevant to crime, might then be changed so as to reduce crime. Consider the following two examples. In an Atlanta study of three matched pairs of high and low crime neighborhoods, Greenberg, Rohe, and Williams (1982) found that boundaries of high crime neighborhoods were high volume arteries that tended to draw vehicular and pedestrian traffic, thereby increasing passers-through in a locale. Fowler et al. (1979) carried out a demonstration project in a Hartford neighborhood and found that the implementation of physical changes such as reducing traffic flow by making street changes, and adding symbolic gateways, subsequent to organizational efforts and policing changes, resulted in less crime. Thus, if physical factors contribute to crime perhaps they can be changed and crime reduced. This possibility appeared in the ideas of Jacobs (1961), later elaborated by Newman (1972, 1979) into defensible space theory and research. The models we propose and test here may, in one sense, be seen as an attempt to revise and amplify this theory by incorporating

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those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice. Portions of an earlier version of this paper were presented at the Annual Meeting of the American Psychological Association, New York, September, 1979. David Haines, Fred Heinzelmann, Hal Proshansky, Amos Rapoport, Richard Titus and Lois Verbrugge provided helpful advice during the course of the project. Patty O’Brien provided programming and data processing assistance. Request reprints from Ralph B. Taylor, Department of Criminal Justice, Temple University, Philadelphia, PA 19122.
considerations from theory and research in human territoriality and social networks.

Defensible space research itself, despite its theoretical and empirical flaws, which are discussed in Taylor, Gottfredson, and Brower (1980) and Mayhew (1979), has developed considerably since its inception. Based on personal observations, Jacobs (1961) made several suggestions about how physical redesign might reduce crime: For example, buildings should be oriented toward the street to provide more natural surveillance, and outdoor spaces should be placed in proximity to intensively used areas. Newman (1972) went further to suggest that if public space could be segmented into small, controllable areas, this would encourage residents to exercise territorial control over these locations and, this in turn would result in less crime. Graphically, his argument can be stated as follows:

design features — stronger territorial — less crime and attitudes and behaviors — antisocial behavior

Newman analyzed archival data from New York City housing projects and found links between design variables (e.g., number of floors in building) and crime outcomes (e.g., indoor robbery rate). Note that in this study, and subsequent ones of this ilk, the hypothesized mediating constructs are not measured. Despite the controversy that surrounded these initial findings (see Taylor et al., 1980 for a discussion), several subsequent researchers have also established links between design features and crime at the site (e.g., Ley and Cybriwsky, 1974; Pablant and Baxter, 1975), street (e.g., Bevis and Nutter, 1977), and neighborhood level (e.g., Greenberg et al., 1982; Fowler et al., 1979). Thus, the focus on design as a covariate of crime has been substantiated.

Nonetheless, there has also been a growing recognition that the link between physical design and crime is modest, and in many cases conditioned by other factors. Links between design and crime are usually betas or correlations of less than .20 (e.g., Brown, 1979). Many instances have come to light of potentially defensible spaces going undefended, due to other social and cultural factors (Merry, 1981a, 1981b). This has led to a wider consideration of possible factors, that may help to explain variation in crime rates at the site or block level. It is in this context that we have proposed an expanded defensible space model, which appears in Figure 1. The model attempts to improve upon earlier formulations by treating human territorial functioning in a
fashion consistent with empirical work, and by incorporating local social ties.

One assumption of the model is that sociocultural context variables have an influence on territorial functioning. Support for this assumption comes from work by Brower (1980) and others (Scheflen, 1971), which has indicated that different cultural or ethnic groups utilized different systems of territorial attitudes and behaviors in order to maintain control. Further, extensive work in criminology and geography (see Harries, 1980, for review) has linked crime and economic and cultural factors, pointing to other ways that sociocultural context may be influential. Below we detail the rationales for our hypotheses and causal ordering.

**Rationale for Hypotheses**

Defensible space features, which in the residential environment would include real barriers, symbolic barriers, and surveillance opportunities, may have three types of causal impacts.

(a) They may have a direct effect on crime and related outcomes. This expectation is supported by the above described research on crime and environment (see also Taylor, 1982, 1983). And although this impact is modeled as a direct effect, we do not assume architectural determinism (see Broady, 1972). Rather, it is more likely that the effect is carried via offenders’ or coresidents’ expectations based on physical features. For example, Brower et al. (1983) found that the presence of fences or
ornamentation suggested to observers that the owner of the property would respond more readily to intrusions.

(b) Defensible space features may support local coresident interaction. This hypothesis was originally suggested by Jacobs (1961) and Newman (1972). The underlying expectation is that to the extent an area is defensible, residents will feel more protected, use the space more, and thus be more likely to come into contact with coresidents.

(c) Defensible space features may strengthen territorial functioning. This hypothesis was originally suggested by Newman (1972). A major aspect of territorial functioning is concern over boundary regulation (Brower, 1980; Sundstrom, 1977; Taylor, 1978); who has access to which spaces when. Boundaries are more salient, and more defensible, the better they are demarcated from adjoining spaces (Newman, 1979). Such salience increases the ease of maintaining access control, and may also facilitate the emergence of stronger, more proprietary attitudes.

Local social ties may have a direct and indirect impact on crime and related outcomes. The expectation of a direct impact is supported by studies such as Maccoby et al. (1958), in which it was found that if there were stronger ties between coresidents, they were more likely to intervene if they witnessed delinquent behavior. And this theme about the potential of social ties to increase adherence to norms of prosocial behavior is evident in both the informal control literature (Janowitz, 1975), and the social networks literature (Wheeldon, 1969). Ties may have an indirect effect on crime and related outcomes via a bolstering of territorial functioning. Territorial functioning is concerned, to a large extent, with control over who has access to which particular spaces, and what activities go on there. As local social ties increase, it becomes easier to discriminate between strangers, and people who live nearby and thus "belong." It becomes easier to predict what kind of activities will go on there. In addition to the benefits accruing to territorial functioning at the individual level, at the group level increased levels of friendship or acquaintance imply more widely shared norms between coresidents. These understandings facilitate access control and regulation over activities.

Finally, the impact of territorial functioning on crime and related outcomes has been suggested by Jacobs (1961) and Newman (1972). And Newman and Franck (1980) observed such an impact in their housing project study. It remains to be seen if such a linkage holds up in the everyday residential environment.

Human territorial functioning has been discussed in a variety of ways. Newman's (1972) original use of the term, for example, suggested
that it was an undifferentiated instinct that could be activated by certain contextual features (Taylor et al., 1980). A substantial volume of empirical research, however, has supported a more careful, circumscribed view of human territorial functioning (Sundstrom, 1977; Taylor, 1978). It is this view that we espouse here. Human territorial functioning is viewed as an interrelated set of attitudes and behaviors concerned with (a) who has access to particular delimited or bounded spaces, (b) what activities are appropriate or permissible in those spaces, and (c) who has control over and/or responsibility for the people, conditions, and activities in those spaces. Stated differently: Territorial functioning refers to a system of person-place or group-place bonds concerned with issues of control, social legibility of setting, and quality of setting.

Thus for each of the causal links in our revised defensible space model, there is conceptual and sometimes empirical support, although the empirical support in several instances tends to be rather spotty or limited.

Rationale for Causal Ordering

Our model (Figure 1) presents a particular causal ordering. Obviously, other alternative causal orderings of the same concepts are also possible. Thus what rationale can we offer for our particular causal model?

The inclusion of defensible space features as the “first” concept in the model is warranted inasmuch as these are largely physical “givens” in the environment. That is, they reflect relatively fixed microfeatures in the locale. Of course design features can be altered, but this occurs rarely, and only with considerable expense. Thus, given the physical nature and relative permanence of defensible space features, they appear at the front end of the model.

Local social ties appear before, and feed into territorial functioning for several reasons. Territorial functioning is viewed not as a solipsistic or individuo-centric system, but rather as a permeable, group-influenced system. The view that territorial functioning is a product of group dynamics is an assumption deeply embedded in the work on territorial behavior and social dominance (e.g., Sundstrom and Altman, 1974). Other treatments of urban territorial functioning (Brower, 1980) have also found evidence for such an assumption. Thus social ties come “second” in the model simply because they must come “before” the concept of territorial functioning.
Rationale for Dependent Variables

Crime is a powerful and omnipresent stressor, and thusly, of considerable practical interest. It is also the concept that has been the main dependent variable in most defensible space work. Whereas past studies of this ilk have focused primarily on property crimes, we will focus on crimes of violence to persons: mugging, assault, aggravated assault, purse-snatch, threatening with a weapon, and so on. These crimes are of interest because they occur on the street, where territorial control might be expected to operate in a deterrent manner. Although many assaults do occur inside the home, most of the assaults we will be discussing here probably occurred outside. We used calls for service data and not actual crime data; thus people were calling in assaults they witnessed on the street. Also, when we looked at the particular types of calls in this category, most of the calls were for the kinds of assaults that were most likely to occur on the street, such as muggings, yoking, and so on. Thus although some of the assaults we will be examining probably occurred inside homes, a large proportion occurred on the street, and this proportion is probably larger than it would have been had we used crime reports instead of calls for service. And although such crimes may be committed by persons from outside of a block, if these crimes do happen frequently on a block, this is strong evidence that residents are not exercising jurisdictional control over that domain.

Fear of crime is our second outcome of interest. It is a topic that has been widely investigated (e.g., Furstenburg, 1971; Baumer, 1979; Garofalo and Laub, 1978; Hartnagel, 1979; Skogan and Maxfield, 1981; Lewis and Maxfield, 1980). This research has suggested that "fear of crime" is more than "fear" of "crime." Rather than being solely a straightforward estimate of the risk of victimization, it is also a reflection of community concern. We measured fear using the two standard NCS items ("How safe would you feel being out alone in your neighborhood during the day? How about at night?"). And, in keeping with the idea that "fear of crime" is more than "fear" of "crime," the block-level correlation between fear and crimes of violence to persons, although positive and statistically significant by a one-tailed test, was modest (r = .22; p < .05; n = 63).

Some may be concerned about predicting fear at the street block, or small-group level. They may feel that fear of crime is primarily an individual-level, affective response. Our justification for treating fear at the group level stems from the notion that fear—in addition to being a quality of individuals—is at the same time a social fact, and a property
of groups and sites (Liska et al., 1982). Thus it can appropriately be modeled at the group level, where that group might be a block, a neighborhood, or even a city (see Liska et al., 1982), as well as the individual level.

Units of Analysis

We examine grouped data: 687 households grouped onto 63 street blocks. The street block is the two facing sides of the street, extending between and bounded by cross streets. The street is a viable, loosely-knit, face-to-face social group. Levels of acquaintanceship may be minimal, as when people simply see one another in their daily comings and goings—or they may be stronger, as when people know about and trust one another. As such a group then, it is appropriate to use the street block as the unit of analysis. There is also considerable precedent for this treatment in other areas of urban research (e.g., Unger and Wandersman, 1983; Brower, 1980).

Because we are dealing with grouped data, and because people living on the same block are more like one another than persons living on different blocks, we have an aggregation problem (Blalock, 1964; Hannan, 1971a, 1971b; Taylor, 1982: 310-317). A correlation (r) between two variables (x,y) contains both between-block variance, and pooled, within-block, or individual-level variance. That is, the overall correlation (rxy) has a between block (rsy) and a within-block (r(x-x)(y-y)) component. It is inappropriate and sometimes misleading to test a model simply using the overall correlation. The data must be decomposed.

Consequently, we have carried out separate block-level and individual-level analyses. Crime and fear of crime are modeled at the block level. The block is in some ways comparable to the project building, which has been the level of analysis at which defensible space research has been couched (Newman and Franck, 1982). In addition, we also carried out an individual-level or site-level analysis of fear of crime, using pooled, within-block residuals. Such an analysis opens up a new area of inquiry in that it asks whether or not the proposed dynamics shown in Figure 1 operate at the individual or parcel level, as well as at the group or block level.

Summary

(a) Past research, conducted primarily in the public housing context, has suggested that defensible space features may contribute to less
crime. We seek to determine if this is also the case in the everyday residential environment. (b) We also incorporate local social ties and territorial functioning into our predictions, and hypothesize that ties may reduce crime directly, and indirectly, via a strengthening of territorial functioning. (c) We also broaden the range of outcomes that have been considered in this research genre to include fear of crime. (d) And finally, we test our model at both the street block, which amounts to a group-level analysis, and at the individual level. The data are decomposed so that these two levels of testing are independent.

**METHOD**

**Site Selection**

The initial step in developing our sampling frame was to define Baltimore City neighborhoods. For this task we used information from the local Community Association Directory, Baltimore City District Planners, and local community leaders. Planners also rated the defined neighborhoods (n = 238) on income and percent rental dwelling units (% RDU) dimensions. The results of this rating task showed good reliability between raters, and good external validity when compared with 1970 census information. (The 1970 data were the only ones that were available for each neighborhood.)

Examination of the bivariate scattergram of the neighborhoods on these two dimensions suggested three types of neighborhood: low-income, predominantly rental; medium income, predominantly homeowner; and mixed. We used a probability proportional to size (PPS) strategy to sample the neighborhood, treating number of households as the size measure (Sudman, 1976). Given the large number of mixed neighborhoods (123) we decided to include twice as many from that group, as compared to the other two groups of neighborhoods, in our sample. This resulted in a sample of three low-income, rental; six mixed; and three medium-income, homeowner neighborhoods using a probability proportional to size (PPS) strategy.

To select blocks, neighborhood leaders in each sampled neighborhood were contacted and interviewed. We asked these leaders to nominate examples of two types of blocks within their neighborhood: blocks where people looked out for each other and worked together (socially organized or cohesive) and blocks where people went their own way (socially unorganized or noncohesive). Our purpose in gathering these nominations was to obtain blocks with varying social climates.
Checks on data indicated that this stratification was successful.) Leaders in each neighborhood were readily able to nominate several examples of each type of block.

We then assessed the block-level defensible space features of each block in our pool of 104 blocks. Subsequently, defensible space scales were constructed, and blocks were put into either a "high" or "low" group using a median split.

Thus our multistage stratified sample consisted of 12 strata: 3 neighborhood types (low-income, rental; mixed; medium-income, home-owned) \( \times \) 2 types of social blocks (organized or unorganized) \( \times \) 2 types of physical blocks (high versus low defensible space). For Survey I (see below for description of Survey I and Survey II), four blocks were sampled from each of the mixed (i.e., those that were neither low income, predominantly rental, or medium income, predominantly homeowned) neighborhood strata and 2 from each of the other strata (i.e., strata involving predominantly low-income rental housing, or medium-income, homeowned housing), yielding a total of 32 blocks. Thirty-one blocks were selected for Survey II using the same procedures.\(^4\) For Survey I, we attempted to obtain 40 completed interviews from each stratum. Because Survey II used a sampling interval that was twice as large as that used in Survey I, the Survey II cases were reweighted appropriately. In Survey II we sought 20 interviews per stratum.

**Household and Respondent Selection**

All blocks were block-listed by field workers; that is, all occupied housing units were counted. The total number of occupied housing units in each stratum was then determined, and designated households were selected using a random start and the appropriate sampling interval. At this level, our primary sampling unit was the household, and not the individual.

When field workers arrived at a designated household and found someone at home, they attempted to complete a screener that asked just a few short questions.\(^5\) If there was just one head of household, and he/she was married, the designated respondent became either the head or his/her spouse. Multiple heads of households were enumerated, and then one was randomly selected following the procedure suggested by Kish (1949).

If no contact was made at a designated household after three attempts at various times during the week, an alternative household was assigned
to the interviewer. Or, if the interviewer was unable to survey the designated respondent after a week of trying, an alternative household was assigned.  

Survey Procedures

Survey I was completed in the summer of 1979; Survey II was completed in the early summer of 1980. Survey I took about an hour to complete, and Survey II took approximately 40 minutes to complete. Survey II was a shorter version of Survey I, including only items that initial analysis of Survey I indicated were important. Fully informed consent was obtained from all respondents, and all respondents were paid for their participation.

Each survey included sections on household composition, residence history, demographics, local social ties, perception of local crime and problems, fear, neighborhood identification, and territorial attitudes.

Respondents: A Sketch of the Sample

The following characteristics describe the full (Survey I and II) sample of 687 households. Of the households, 53% were owner occupied and 47% were rented; 39% were white and 61% were nonwhite, and average household size was slightly over three persons; the median household size was two. Average respondent age was 44 years (median = 40), and average educational level was 11th grade. Average length of residence in the neighborhood was 16 years (median = 12), and 22.2% of the sample was unemployed at the time of their interview.  

Site-Level Assessments

After a household was interviewed, color slides were taken of the front and rear of the house. The physical features shown in these slides were subsequently rated by two independent raters. Details regarding interrater reliability are described in analyses that use those variables.

Police Data

Police calls for service data for calendar year (CY) 1978 were obtained for every study block from the Baltimore City Police Department. We also obtained, for each block, Part I crime data for calendar year (CY) 1978 and 1979.  

(Calls for service data for 1979 were
not available in time to be included in these analyses.) In our analysis, we focus on police calls relevant to crimes of violence against persons. Volume of calls for service in this category correlated most strongly with the Part I (serious) crime of aggravated assault. Crime levels were transformed into rates using occupied households as the denominator.

*Transforms*

Variables with the skewness of greater than 1 were normalized via a log transform, and subsequently analyzed. For the analyses we report here, this transform was carried out only on the crime data. One was added to each score before transforming.

*Multicollinearity*

We carried out the Haitovsky test, as recommended by Rockwell (1975) on our block level matrix of significant (p < .05) predictors of crimes of violence, and significant predictors of fear. The results indicated that the predictors exhibited multicollinearity (i.e., the hypothesis that the matrix was singular could not be rejected). As Gordon (1968) stated, multicollinearity can result in unstable beta weights as similar variables fight for the same “chunk” of explained variance. Thus we followed his recommended procedure and inverted each correlation matrix of predictors, and began eliminating variables which had the most shared variance with the other predictors (i.e., \( C_{ii} \) on the inverse was large). Redundant predictors (beginning with the most redundant) were eliminated, and the resulting inverse reexamined after each deletion, until the matrix of predictors “passed” the Haitovsky test. The variables that ended up being eliminated were some territorial behavior measures (levels of gardening), photographic measures of dwelling unit upkeep, some social network variables, and a socio-economic variable.

One may object that this procedure may result in path models that are misspecified. That is, if we ignore a particular exogenous (socioeconomic) variable that is a cause of one or more of the endogenous variables in the model, the resulting coefficients may be misleading. To guard against this possibility we also ran the regressions for the path analyses, including the exogenous variable that had been eliminated by the Rockwell procedure. In both of the block-level models, the only variable that we “put back in” to avoid misspecification was homeownership. The inclusion of the extra exogenous variable made very little
differences in the results, and we discuss those differences in the results section.

Measuring Defensible Space
Features and Territorial Markers

At all surveyed households, slides were taken of the front and back. These slides were subsequently rated independently by two raters, using closed-ended rating scales. Defensible space features that we measured were surveillance opportunities, real barriers, and symbolic barriers. Territorial markers that we measured included gardening and ornaments. The endpoints of the real barriers scale were as follows: "There is no barrier that restricts and directs access from the alley/sidewalk, and no defined point of entry onto the property" (low real barriers), and "There is a barrier more than 20" in height, either continuous or with a controlled point of entry through the barrier" (high). The endpoints of the symbolic barrier scale were as follows: "One can't tell for sure where the property ends and the public sidewalk/alleys begins" (low symbolic barrier), and "The boundary line of the property is defined by an edge feature more than 20" in height" (high). Mid scores on this scale were attuned to changes in texture, level, materials, and low barriers. We combined real and symbolic barriers to yield an additive scale. For the latter interrater reliability (r_intraclas) was .98, and internal consistency (Cronbach's alpha) was .92. The endpoints of the gardening scale were as follows: "There is little or no attempt at landscaping" (or gardening), and "Half the site or more is given over to high-demand gardening" (high). Interrater reliability was .85.

Analysis Overview

Data were analyzed by recursive causal models, using the decomposition approach suggested by Alwin and Hauser (1975). Causal modeling is the only analysis that would allow us to directly test all of our hypotheses. An alternative approach, such as hierarchical stepwise regression (Cohen and Cohen, 1975) would not have provided us with information about the mediating or indirect path coefficients hypothesized by our model. Thus recursive path analysis provided the best approach to testing our model.

Our causal model is linear and fully recursive; that is, all causal effects are assumed to occur, and to be unidirectional. Such an assumption denied (in the model) the existence of possible feedback loops, or of
dynamic interchange. Other investigators, examining other versions of defensible space theory have made a similar assumption (Newman and Franck, 1982).

Furthermore, to make our model fully recursive, we “pulled apart” the territorial cluster of predictors. In the two block level models, we assumed that attitudes about block spaces preceded attitudes toward the larger neighborhood. In the case of the individual level model, we assumed that social dynamics, such as recognition, preceded attitudes such as responsibility. We carried out the analysis on standardized variables, and thus report path coefficients. We use $\sqrt{1-R^2}$ for the residual path coefficient.

Given our low number of cases (63), we decided to adopt an alpha level of .10 in the two models of block level outcomes. This gives us an acceptable level of power ($1-\beta>.80$) for detecting medium-sized effects ($r = .30$) (Cohen, 1977). Given this alpha, coefficients $>|.17|$ are significant at $<.10$; and coefficients $>|.21|$ are significant at $<.05$. Paths with coefficients of less than $|.05|$ were trimmed from the model.

In the model of individual level fear, coefficients $>|.07|$ are significant at $p < .05$, and coefficients $>|.10|$ are significant at $p < .01$.

**Predicting Crimes of Violence to Persons**

**Variables included.** In the reduced, nonmulticollinear matrix of predictors, the following variables were included: real and symbolic barriers in front, proportion of respondents who belong to an organization to which coresidents also belong (SOCIAL TIES). Two measures of territorial functioning were included: the extent to which respondents felt responsible for what happened on the sidewalk in front of their house and the alley behind their house (NEAR HOME RESPONSIBILITIES), and the proportion of respondents who were able to provide a neighborhood name (NEIGHBORHOOD IDENTIFICATION). The latter was residualized with respect to race, owner/renter status, trust in neighbors, and gardening in back.

**Results with reduced matrix.** Results of our path model predicting crimes of violence to persons appear in Figure 2. The zero order correlations among variables in this model appear in Table 1. In parentheses in Table 1, we report the correlations reproduced by the model. For all correlations, the reproduced values are within $\pm .05$ of the original correlations, confirming that the model “fits” the data (Kerlinger and Pedhazur, 1973). The model explains 18% of the
Figure 2  Path Analysis of Crimes of Violence to Persons

variance in crimes of violence ($F(4,58)=3.19; p<.05$). (Throughout we report adjusted total $R^2$)

Real and symbolic barriers have a sizeable, and almost significant, direct impact on crimes of violence ($p_{ji} = -.164$), which represents 64% of their total causal impact. Real and symbolic barriers also significantly bolster neighborhood-level identification, ($p_{ji} = .311$), but not near-home responsibility ($p_{ji} = .060$). The fact that real and symbolic barriers do not support feelings of territorial responsibility for near-home spaces is not surprising as the latter spaces (sidewalk, alley) are beyond the area bounded by the defensible space features. Thus defensible space strengthens some aspects of territorial functioning, at the same time that it has a direct impact on crime.

The hypothesized direct impact of social ties appears, and is significant ($p_{ji} = -.201$). This confirms the notion that informal social control may directly reduce crime-related outcomes. The direct effect of local ties comprises 68% of its total causal influence. Thus 32% of its causal impact is mediated by territorial functioning. Our expectation that local ties would strengthen territorial functioning receives very strong support. Local ties significantly enhance territorial responsibility for near-home spaces ($p_{ji} = .274$), and neighborhood identification ($p_{ji} =
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**NOTE:** Correlations reproduced by the path model appear in parentheses.

.193). Thus, the model confirms both the expected direct impact of social ties, as well as the expected indirect effect.

Both territorial variables exhibit a significant dampening impact on calls for crimes of violence: $p_{ji} = −.24$ for responsibility, $p_{ji} = −.252$ for neighborhood identification.

**Results with homeownership included as exogenous variable.** The inclusion of homeownership as an exogenous variable changed the results of our path analysis. The direct effect of homeownership on crimes of violence was of moderate negative size ($p_{ji} = −.12$), but did have a significant impact on social ties ($p_{ji} = .46$). Not surprisingly then, this reduced the direct effect of social ties on crime somewhat from −.20 to −.15. It did not reduce the significant impacts of social ties on territorial functioning. Homeownership also had a significant impact on near home responsibility ($p_{ji} = .21$), and a moderate nonsignificant impact on neighborhood identification ($p_{ji} = −.15$). Nonetheless, the direct effects of the two territorial variables on crime were not diminished substantially ($p_{ji} = −.22$ for near home responsibility; $p_{ji} = −.27$ for neighborhood identification). Finally, the inclusion of homeownership reduced slightly from −.16 to −.12, the direct coefficient of real and symbolic barriers on crimes of violence. In sum, the only substantive change caused by the inclusion of the homeownership variable was to reduce the coefficient of the direct effect of social ties on crime somewhat, rendering it nonsignificant. Effects of social ties on
territorial functioning remained significant, and effects of territorial functioning on crimes of violence remained significant.

*Predicting Block-Level Fear*

*Variables in the model.* The reduced, nonmulticollinear matrix of predictors included three exogenous variables: the proportion of respondents on the block who were black (RACE), REAL AND SYMBOLIC BARRIERS IN FRONT, and SURVEILLANCE OPPORTUNITIES IN FRONT, two physical, defensible space measures. The social variable included was the proportion of occupied addresses on the street where the respondent knew someone by face or name (SOCIAL TIES). This information had been obtained in the interview by showing each respondent a schematic including all of the houses on the block, with his/her address clearly marked, and asking for each address if the respondent knew someone there by face or name. The same two territorial variables were included in this model as in the crime model: NEAR HOME RESPONSIBILITY and NEIGHBORHOOD IDENTIFICATION. The outcome (FEAR) was the summed response to the day fear and night fear questions. All variables were block level means, except for RACE, which was a proportion.

The additional exogenous variable included in the nonreduced matrix of predictors was the proportion of respondents who were homeowners.

*Results with reduced matrix of predictors.* The results of our path model predicting block fear appear in Figure 3. The original correlations and the correlations reproduced by the path model appear in Table 2. Reproduced correlations match the original ones confirming the “fit” of our path model. The model explains 37% (F(6,56) = 5.59; p < .001) of the variance in fear.

Of the causal impact of real and symbolic barriers, 62% is in the form of a direct impact on fear. The coefficient for this direct effect is sizable (p_{ij} = -.164). The remaining causal impact of real and symbolic barriers (27% of total effect, 71% of total indirect effect on fear) is channeled via territorial functioning. And the expected enhancement of territorial functioning by defensible space features is evident with neighborhood identification (p_{ij} = .319). The path coefficients of surveillance opportunities are all very small or essentially zero. Thus this type of defensible space feature failed to demonstrate the hypothesized impact.
Of the causal impact of local ties on fear, 81% is direct, and the coefficient for this path \((p_{ji} = -0.285)\) is significant and in the hypothesized direction. Thus knowing more people on the street has a direct dampening influence on fear. And the indirect influence of local ties on fear via territorial functioning appears as expected. The impact of acquaintanceship on feelings of territorial responsibility for near-home spaces is sizable and significant \((p_{ji} = 0.38)\). Thus one of the important mediating paths hypothesized by the model is substantiated.

The impacts of the two territorial variables on fear are significant and in the hypothesized direction \((p_{ji} = -0.171, p_{ji} = -0.222)\). Thus territorial functioning has a significant, direct impact on fear.

Contrary to expectations, increasing feelings of near-home responsibility have a dampening impact on neighborhood-level identification \((p_{ji} = -0.267)\). Thus territorial functioning at the block and neighborhood level appears to operate in a disjunctive fashion instead of in a mutually supportive fashion.

The bulk of the causal impact of racial composition (94%) is in the form of a significant direct impact on fear \((p_{ji} = 0.359)\). Predominantly white blocks exhibited lower fear levels. The coefficients describing the impacts of race on the intervening social and territorial variables are modest.

Results with homeownership included as exogenous variable. When we carry out path analyses including homeownership as an exogenous
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NOTE: Correlations reproduced by the path model appear in parentheses.

variable, the model changes very little. The direct effect of SOCIAL TIES on FEAR remains very strong ($p_{ij} = -.293$), and the effect of SOCIAL TIES on NEAR HOME RESPONSIBILITY remains very strong ($p_{ij} = .324$). Finally, the territorial variables retain their significant effect on FEAR ($p_{ij} = -.184$ for NEAR HOME RESPONSIBILITY, $-.220$ for NEIGHBORHOOD IDENTIFICATION).

One change, and it is small, is a slight increase in the direct effect of REAL AND SYMBOLIC BARRIERS IN FRONT on FEAR ($p_{ij} = -.180$).

**Summary on Block-Level Models**

Defensible space features in the form of real and symbolic barriers have significant impact on fear, and a moderate impact on crimes of violence. Surveillance opportunities were not relevant to these two outcomes. Social ties strongly dampened crime and significantly dampened fear. Ties significantly enhanced territorial functioning. Territorial functioning significantly dampened both crime and fear. Both path models, although trimmed, showed acceptable levels of fit. Examination of the models including homeownership demonstrated that the models based on the reduced matrix of predictors were not misspecified.
Figure 4 Path Analysis of Individual Fear

*Predicting Individual-Level Fear*

*Variables in model.* All significant zero order predictors constituted a nonmulticollinear matrix of predictors, thus all were included in the path model. Three exogenous variables were included: length of residence on the block (LENGTH OF RESIDENCE), SEX (males coded 0, females coded 1), and household INCOME. No physical or social variables were included. Two territorial variables merited entry: ability to distinguish between strangers and persons who belong in backyard, and on front porch or steps (HOME SPACE RECOGNITION) and feelings of responsibility for what goes on in these spaces (HOME SPACE RESPONSIBILITY). Coefficient alpha for the RECOGNITION scale was .83; for RESPONSIBILITY .87. The outcome is FEAR (alpha = .64). All variables are pooled, within-block residuals; that is, individual deviations from their respective block mean.

*Results.* The results of our path model predicting fear at the individual level appear in Figure 4. The zero order correlations of the variables in the model appear in Table 3 as well as the correlations reproduced by the path model. All reproduced correlations are acceptably close to the original, indicating that the model fits the original data. The model explains a significant 14% of the variation in individual level fear (F(5,614) = 19.23; p < .001).

Several demographic variables are included in the model. Length of residence works contrary to the expected direction, revealing a positive
direct impact on fear; $p_{ji} = .25$. This result becomes more sensible, however, when we recall that all variables in this model are individual deviations from block means. Thus, a positive score on LENGTH OF RESIDENCE means that respondent has lived on that block longer than the average of all respondents. In short, length of residence is probably working as a proxy for age here. And, other studies have demonstrated that the elderly, as compared to the nonelderly, have a higher fear of crime (DuBow et al., 1979). These more stable, older residents also demonstrate weaker territorial attitudes, which would be in keeping with their lower level of environmental mastery.

Being female has strong direct impact of fear ($p_{ji} = .20$), which is consonant with other studies that have also found women to be more fearful than men (DuBow et al., 1979). Women felt a significantly stronger sense of territorial responsibility for home spaces perhaps because many of them may spend more time at home ($p_{ji} = .072$). And, as territorial responsibility had a significant dampening effect on fear ($p_{ji} = -.13$), this means that the indirect impact of sex on fear (via territorial responsibility) was opposite to its direct effect. Of course, the size of the direct effect far outweighs the size of this indirect effect.

The final demographic variable, income, showed a much smaller direct impact on fear than sex ($p_{ji} = -.07$), although the sign of the path is in the expected direction. Much larger (and highly significant) was income’s bolstering of territorial responsibility ($p_{ji} = .21$). And via this pathway, income had a dampening impact on fear. Thus in this instance,
as with length of residence, the sign of the direct and indirect pathways are similar.

With regard to the territorial variables, the responsibility variable had a significant dampening impact on fear ($p_{ij} = -.13$). Ability to distinguish between strangers and insiders had a negligible direct impact on fear, but did dampen fear via its significant impact on responsibility ($p_{ij} = .30$).

In sum, the individual-level model differs from the two block-level models in that it includes demographic factors, and excludes social and physical variables. The individual and block models are similar, though, in that territorial functioning is included in all of them. Thus, territorial functioning is relevant to fear at the individual as well as the group level of analysis.

The individual-level model is also interesting in that length of residence, sex, and income all had significant impacts on one of the mediating territorial variables. (Income's impact on territorial functioning could be reflecting its link with homeownership.) Thus features of the individual are associated with less fear, in part, because these characteristics predispose the person toward stronger territorial attitudes. Thus being younger, a woman, and of higher income, are all associated with stronger territorial functioning.

One last noteworthy, and understandable difference between the individual model and the block models is the locus of the particular territorial variables included. In the block models the spaces in question were near-home, public spaces, such as sidewalk or alley. In the individual model, the referent shifts to more proximal home spaces, such as backyard, and front yard, or steps. Thus the “public” spaces are relevant to group functioning, and the more “private” outdoor spaces are relevant to individual level functioning.

**DISCUSSION**

We have developed and tested a model (Figure 1) concerned with explaining variations in crime and fear. Our model has incorporated as explanatory variables measures of physical defensible space features, local social climate, and territorial functioning. The inclusion of all three types of explanatory constructs has been supported. The concepts varied, however, in their predictive power. Turning in the strongest performance were the territorial variables, which demonstrated significant direct effects in all three models. In the two block-level models, the
inclusion of a further exogenous variable to control for possible misspecification of the model did not diminish these impacts. Turning in a strong performance, social factors significantly boosted territorial functioning in both block-level models, and social factors had a significant dampening effect on fear, even with the inclusion of homeownership. Performing somewhat more weakly than expected were the physical defensible space features, which had sizable, but largely nonsignificant direct effects on the block level outcomes. They did, however, significantly boost neighborhood identification. This is probably due to the fact that blocks with more extensive real and symbolic barriers were also blocks that were of somewhat higher physical quality, and this increased quality was associated with feelings of greater satisfaction and attachment (Fried, 1982).

Nonetheless, our findings regarding the size of the effects of defensible space physical features may seem disappointing to some. We would therefore hasten to point out that the effect sizes observed here are comparable to what has been recently observed in other studies, (e.g., Newman and Franck, 1982; Brown, 1979).

Second, it is inevitable that the size of the direct effects should diminish as relevant mediating social and territorial variables are carefully measured and incorporated into the model. And finally, the pattern of physical effects is in keeping with the current wisdom (e.g., Merry, 1981a, 1981b), that physical features “can’t do it all” when it comes to ensuring safety and security. More specifically, they cannot even do most of it; they play a minor, although significant, role in comparison to the influence of social and territorial variables.

The larger context proved relevant as well. In the nonreduced block fear and block crime models, homeownership significantly enhanced territorial responsibility. We think that homeownership is operating here as a proxy for contextual stability, indicating how social and territorial aspects of the block are supported by a steady-state background. Cultural factors proved relevant as well, with the inclusion of race in the fear model. More predominantly white blocks had significantly lower fear levels, and significantly higher levels of territorial responsibility. Thus we agree with both Merry and Podolefsky that we must consider the larger sociocultural context and how it contributes to the dynamics of interest.

Shifting into a more speculative vein, the following points are suggested by our analyses. We have confirmed that blocks function as small-scale social units. Social climate and strength of territorial
functioning on the block are both conditioned by the larger sociocultural context—racial composition, neighborhood stability, and so on. As social bonds—perhaps even of a superficial nature such as acquaintance—evolve, residents’ interest and involvement in the public spaces of the block is increased. The social bonds serve to permit a wider range of secure residential functioning. Individual residents can increase the orbit of their activities—and duties—and along with this, their expectations. They take more of a proprietary interest in and concern for near-home spaces such as sidewalks in front of the house, and alleys behind the house. Nominally public places—where strangers may come and go unhindered with few strictures regarding appropriate behavior—become somewhat transformed. Partially shared expectations emerge regarding what is and what is not appropriate behavior in these settings. Residents develop an involvement in these near-home settings and feel some level of responsibility for seeing that these norms are respected. Feeling responsible for what happens in these near-home, public spaces suggests a willingness to exercise informal social control, to intervene, or at least summon assistance in instances where the loosely agreed upon norms are flagrantly violated—that is, excessive noise at 3 a.m., youths spray painting cars, and so on. The social ties would be relevant again at this point inasmuch as they provide reassurance to a resident that should he or she adopt an enforcement role, coresidents may support him or her; or, at the very least, he or she knows who his or her nonsupporters would be.

The above scenario, which of course ignores how, over time, high levels of threat (crime) may “atomize” bonds of community (Conklin, 1975) or cause a restriction in the range of territorial functioning, suggests several practical ways that change agents—be they governmental or volunteer—may encourage forces supportive of local order. At the contextual level, matters such as increasing homeownership are one obvious strategy, one which has been promoted in Baltimore and many other urban areas. At the block level, strategies to assist in the development of coresident bonds—neighborhood membership drives, “get together” events such as bake sales and bazaars—would be helpful. Wandersman and his colleagues (e.g., Unger and Wandersman, 1983) have considered the virtues of block organization themselves, and this is one possible strategy for improving social climate. Territorial functioning can be enhanced by supporting behaviors that may result in strengthened attitudes. For example, clean-up and beautification contests and projects may result in a more concerned and involved
attitude toward the public spaces adjacent the home. Strategies such as these are suggested by our findings.

Of course, as our study is limited, further clarifying research efforts are needed. Our study is only cross-sectional. (Some may feel that in light of this, our path analyses are inappropriate. Nonetheless, these analyses were the only way we could test all the links posited by our model. And had we done regression analyses, which may have been more acceptable to some, our conclusions would have been little changed, albeit less specific.) Offsetting this limit are the facts that (a) we have systematically sampled a broad range of environment;\(^\text{10}\) (b) we have employed confirmatory as opposed to exploratory path analyses, and have tested for possible problems of misspecification and multicollinearity, and (c) we have carried out analyses using decomposed data to avoid the aggregation problem. Our results are the first systematic examination of physical, social, and attitudinal (territorial) variables as relevant to crime and fear at the level of the street block.

\section*{NOTES}

1. The correlation between neighborhood median household income and percentage of rental dwelling units, was $-.45$.

2. There were 16 low-income, predominantly rental neighborhoods, 123 mixed neighborhoods, and 49 medium-income, homeowned neighborhoods. Higher-income neighborhoods (1970 median income $> \$14,000$) were excluded from the sample in consideration of the outcomes of interest.

3. At the time of the project the third author and other project staff (Whit Drain) were affiliated with the Baltimore City Department of Planning. Their close working relationships with community groups allowed us to pinpoint leaders in the sampled neighborhoods. In cases where leadership was shared, both leaders were interviewed.

4. The reason 31 blocks were sampled for Survey II instead of 32 is as follows. The low-income rental, low-defensible space, high social cohesion stratum included one very large block, and after putting this block in the Survey II frame, there were no more blocks to choose from in that stratum. Thus we double sampled from this last remaining block, treating it really as two blocks, and thereby maintaining the appropriate weighting across strata. Thus, with this one exception, blocks were perfectly distributed across strata (for each survey, 4 from each stratum containing a mixed neighborhood, and 2 from each other stratum).

5. Field workers worked evenings and weekends, as well as weekdays. At each designated household (if necessary), at least one contact attempt was made at each of these three time periods.

6. In some strata, the desired number of interviews fell below the expected number, because on some blocks we ran out of alternate addresses before the desired number of interviews was obtained. In Survey I, we sought to obtain 15 cases per block, for 480 completes. We ended up with 447. In Survey II we sought 7 or 8 interviews per block, for a
total of 240. We actually obtained 240 interviews. Examination of the “shortfall” of completed surveys, by block, in Survey I, indicated that it was not patterned by strata, thus suggesting that the nature of the final respondent pool probably did not produce serious bias.

7. Several factors preclude any serious attempts to validate our sample by comparing it with census data. First, our sample deliberately ignored some areas (high income neighborhoods) and, although our primary sampling unit was the neighborhood, respondents were not picked in proportion to neighborhood size. These two factors make it unlikely that our sample means or proportions will closely match population parameters. Nevertheless, on several parameters, our sample appears quite close to the city population, as described by the 1980 Census. In the city the owner/renter split is 47%/53% (close to our 53%/47% split). The proportions of white to black households is 44%/56%, which is not far from our 39%/61% figure for households. Our average household size of 3 is only slightly larger than the city average of 2.74, and the discrepancy is probably explained by our excluding upper income areas. Our average age of 44 almost exactly matches the 1970 SMSA adult mean of 43. Our median length of residence (12 years) closely matches that observed (13 years) in a large 1976 survey of Baltimore area households (Vergrugge and Taylor, 1976). Thus, despite the nature of our sampling procedure, our resulting sample closely resembles the city population on several parameters.

8. Part I offenses, as defined by the FBI, include criminal homicide, forcible rape, robbery, aggravated assault, burglary, commercial and residential larceny/theft, and motor vehicle thefts.

9. Crimes of violence to persons include aggravated assault by an armed person, common assault, cutting assault, murder, rape, shooting, and yoking. The other categories of police activity were crimes against property in private spaces (house and yard), crimes against property in public spaces, disturbing the peace and social nuisances (exposure, intoxicated persons, disorderlies, family disturbance), and other.

10. Our sample, albeit systematically drawn, was not random. It was, rather, an analytic sample drawn so as to maximize variation on certain parameters: contextual stability, social variation, and physical variation. Consequently one might expect that our pattern of results might not be highly generalizable to other samples. But, generalizability is always an empirical issue, and thus one cannot claim a priori that our results—given the nature of our sample—will necessarily have low generalizability. In addition, other studies of this ilk, that have assessed one or more of the hypotheses tested in this study, have already obtained comparable results. Thus we feel that despite our special sample, our pattern of findings have a good chance of being broadly applicable.

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