NEIGHBORHOOD CHANGES IN ECOLOGY AND VIOLENCE*

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We investigate links between ecological changes and changes in violence in Baltimore neighborhoods in the 1970's. The two most salient ecological changes during the decade were (1) the emergence of a large number of gentrifying neighborhoods and (2) the further absorption of several older, minority neighborhoods into an "underclass" status. Relative deprivation and social disorganization each predict increasing violence in gentrifying and emerging underclass neighborhoods. But, relative deprivation theory highlights the role of changes in economic status, whereas social disorganization highlights the role of changes in stability or family status. We further suggest that connections between ecological change and changes in disorder are contingent not only on historical context, but also on overall neighborhood structure at the beginning of the period. We hypothesize: (a) neighborhoods becoming more solidly "underclass" will experience increasing violence as status and stability decline and (b) emerging gentrifying neighborhoods will experience increasing violence as status and stability increase. Controlling for spatial autocorrelation, results support these hypotheses. In emerging underclass neighborhoods status changes are most clearly linked to violence changes, whereas in gentrifying neighborhoods violence shifts are most closely tied to changing stability.

Perhaps the most obvious effect of the mobility of the population within a city is the striking instability of local life. Neighborhoods are in a constant process of change. (McKenzie, 1968 [1921]: 62)

We investigate links between changes in urban neighborhood structure in

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the 1970's and changes in violence levels, focusing on Baltimore, Maryland. Nationally, the two most prominent changes in urban neighborhoods during this period were the dramatic expansion of underclass, usually minority neighborhoods and the emergence of gentrifying neighborhoods. As a neighborhood becomes more clearly underclass, relative deprivation and social disorganization theories would anticipate increases in violence, albeit for different reasons. In addition, given the ecological nature of gentrifying neighborhoods, both views would anticipate increasing violence although, again, for different reasons.

Our research builds on previous human ecological research on disorder. Accordingly, we focus on processual dynamics and develop measures indicative of changing neighborhood roles in the larger urban mosaic. We articulate the ecological approach by taking a differentiated view of change processes.

EMPIRICAL LINKS BETWEEN COMMUNITY ECOTOLOGY AND DISORDER

Despite the acknowledged importance of ecological change at the community or subcommunity (i.e., neighborhood) level (Choldin, 1984), until about 1980 the bulk of investigations were cross-sectional in nature and thus did not address change. Numerous studies considered ecology and delinquency (Bordua, 1958; Chilton, 1964; Chilton and Dussich 1974; Lander, 1954; Rosen and Turner, 1967; see Bursik, 1986a or Taylor, 1987 for overviews). Bordua's contention that delinquency reflected "anomie" rather than lower socioeconomic status "led to the important series of replications . . . that confirmed the existence of the economic status and delinquency [negative] relationship" at the neighborhood level (Bursik, 1986a: 41).

Cross-sectional studies of crime and violence similarly linked disorder more generally with low economic status (Harries, 1980: 73) at the community or subcommunity level. Further, the American studies of crime and microenvironment link violence levels with minority and black populations in studies ranging from 1950, such as Schmid’s (1960) analysis of census tracts in Seattle, through 1970, such as Munford et al.’s (1976) study in Atlanta.

Complementing community-level studies are cross-sectional investigations of violence-based measures of disorder at higher levels of aggregation, such as the city, SMSA, or state. Links between the proportion of black population and violence have been observed (e.g., Rosenfeld, 1986), but in some studies the effects of race are markedly reduced after controlling for structural position and/or deprivation and inequality (e.g., Blau and Blau, 1982; Loftin and Hill, 1974).

The interpretation of the race-violence linkage on the aggregate level has been contested. Some maintain that the black population’s higher violence
levels reflect the "subculture of violence" (Wolfgang and Ferracuti, 1967) present in the South, from whence blacks emigrated. Supporting such a thesis are results such as Messner’s (1983). He observed that SMSA homicide rates were explained by poverty, proportion black population, and southernness, but that black population influenced violence only in non-southern SMSAs. Others maintain, however, that the black-homicide linkage reflects largely a disadvantaged economic position. Sampson’s (1987: 348) examination of robbery and homicide rates in 150 cities, for example, suggested “there is nothing inherent in Black culture that is conducive to crime. Rather, persistently high rates of black crime appear to stem from the structural linkages among unemployment, economic deprivation, and family disruption in urban black communities.” In his study, family disruption had the largest impact on black violence.

Moving beyond these cross-sectional investigations, studies directly examining change, focusing on delinquency as an index of disorder, have appeared in the last decade. A raft of studies of Chicago’s 75 “natural areas” (Choldin, 1984) by Bursik and colleagues (Bursik, 1984, 1986a, 1986b; Bursik and Webb, 1982; Heitgard and Bursik, 1987) confirmed that changes in delinquency were linked with changes in ecological structure, the nature of the linkage varied across historical periods, and part of the changes between 1960 and 1970 may be explained by racial changes in adjoining areas. Also, during the same period, Bursik observed that declining economic status, as reflected by increasing unemployment, and an increasing nonwhite population, were both associated independently with increasing delinquency (Bursik, 1986a: Table 4). The strength of the racial change-delinquency and economic change-delinquency links were very similar. Further, delinquency changes were not only linked with change parameters, but were also associated, independently, with prior compositional characteristics (Bursik, 1986b, 1986a: Table 6). Thus, ecological changes and delinquency rate changes are connected, but in a way conditioned by historical context and extracommunity dynamics.

Studies complementary to the Chicago ones indicate the generality of Bursik’s findings. In Los Angeles, Schuerman and Kobrin (1986) linked population changes with delinquency changes in emerging high delinquency areas over a 20-year span. In Racine, Wisconsin, Shannon (1981) not only identified population shifts linked with increasing delinquency rates, but also implicated ecological factors.

In sum, studies of delinquency indicate that social disorganization, brought about by rapid turnover or racial change, is linked to disorder, although economic factors, such as increasing unemployment, are also implicated. Research on violence has generally been carried out at a higher level of aggregation and has, in contrast, more strongly linked economic factors to violence. Research has also implicated racial and cultural factors and has
sought to disentangle the relative contributions of race, which is purportedly linked to a subculture of violence, and economic deprivation. We now examine in more detail the theoretical arguments underpinning these linkages.

THEORIES EXPLAINING COMMUNITY ECOLOGY-DISORDER LINKS

RELATIVE DEPRIVATION

Poverty and related structural factors may “explain” crime in general and violent crimes in particular. Miller (1958) combined class and cultural arguments suggesting that the lower class had a value system that encouraged violence as an expression of toughness. Poverty also figured in the explanations of Merton (1968) and Cloward and Ohlin (1960). Although there has been some tendency to concentrate on absolute poverty levels in investigating the poverty-crime link, considerable recent research concentrates on the effects of relative deprivation.

The notion that relative deprivation might affect crime is a basis for Merton’s anomie theory. But Merton has been faulted for his tendency to explain only utilitarian crimes (Clinard, 1964). Cloward and Ohlin’s opportunity theory, building on Merton, uses relative deprivation to explain both utilitarian and nonutilitarian (violent) crimes.

Relative deprivation may encourage violent crime because it generates a sense of injustice. Perceived deprivation relative to better-off others generates a sense of injustice in an egalitarian society such as our own because of the contradiction between salient success values and the maldistribution of opportunities to achieve them.¹

SOCIAL DISORGANIZATION

Founders of the “Chicago school” of human ecology recognized that urban neighborhoods were often in flux. This is represented in the opening quote from Roderick McKenzie and in the central concern of human ecology with

¹. Relative deprivation is thought to have an effect on violent crime not only because of the resentment it causes but also because of its socially disorganizing effects (Blau and Blau, 1982). Racial and income inequalities widen the gulf between classes and ethnic groups, limit interaction between neighbors, and undermine informal and formal community efforts to control crime. Indeed, the sense of injustice may seem to legitimize violence against the haves by the have-nots. In light of this, there has been some tendency to combine relative deprivation and social disorganization measures in efforts to predict levels of violent crime (Blau and Blau, 1982; Sampson, 1985). Empirical research has not unequivocally supported the relative deprivation-crime link (Loftin and Parker, 1985; Messner, 1982; Sampson, 1985; Williams, 1984); sometimes other variables, such as racial composition, southern origins, or residential mobility, have proven more influential.
the process of adaptation of "territorially-based" socioenvironmental units (Hawley, 1984: 2). Moreover, human ecologists suspected that change and extensive turnover in urban neighborhoods were linked to disorder. McKenzie noted, for example (1968 [1921]: 63): "Rapid community turnover also plays havoc with local standards and neighborhood mores. It is impossible to have an efficient local opinion in a neighborhood where the people are in constant movement . . . the decay of local standards is a pertinent cause of moral laxness and disorderliness." Thus, neighborhood change was not only salient, but also of practical import. For example, Shaw and McKay's (1969) observation that high delinquency rates prevailed in Chicago communities characterized, over several decades, by high levels of turnover reinforced such connections. Bursik's findings linking changes in racial-ethnic composition with delinquency changes also support such an argument.

Although ecological correlations do not address individual-level relationships (Thorndike, 1939), the patterns observed do suggest that ecological changes weaken levels of informal social control (Greenberg and Rohe, 1986) in the community by attenuating local social ties. Unfortunately, there have been no studies of changing informal social control levels in changing neighborhoods. But, in a cross-sectional study Maccoby et al. (1958) observed that controls over juveniles were weaker in a more heterogeneous versus a more homogeneous area. And Deutschberger (1946) found that lost friends in the local social networks of youths were less readily replaced in changing as compared with stable neighborhoods.

Informal social control is a complex concept (Meier, 1982). Nonetheless, available evidence supports the idea, albeit indirectly, that informal social control may be weaker, and social disorganization greater, in neighborhoods changing more rapidly.

ECOLOGICAL IMPLICATIONS OF THE TWO PERSPECTIVES

We now explain how the constructs of these two theories will be linked to particular neighborhood features. It is necessary, first, to discuss the analytical tools we use. We turn, therefore, to a brief overview of ecological characterizations of neighborhood structure.

ANALYTIC TOOLS: FACTORIAL ECOLOGY DIMENSIONS

In cross-sectional terms, factor and principal components analysis of census data has indicated three major dimensions of community structure: status, racial composition, and stability, life-style, or family status (Frisbie, 1984; Greer, 1964: 31-33, 125-138; Hunter 1971, 1974a, 1974b). These three dimensions are widely used to differentiate communities and neighborhoods (Choldin, 1984: 266). Less widely used are analyses of change parameters (e.g., Hunter, 1971: Table 6) based on the same classes of variables. Such
analyses provide more insight into change processes (Frisbie, 1984: 135) than do comparisons of cross-sectional ecological structures at two points in time. Accordingly, we use principal components analyses of cross-sectional and change variables to create cross-sectional and change factorial ecology dimensions.

A neighborhood's principal component score on a factorial ecology dimension indicates its standing on that linear composite vis-à-vis other neighborhoods. Such a relativized measure is fully appropriate because human ecology is concerned with processes of competition and adaptation, which are inherently relativistic. "An ecological approach . . . suggests that neighborhoods and suburbs will be better understood as parts of the metropolitan whole, that part-whole relationships will reveal the functions of the subcommunity [or neighborhood]" (Choldin, 1984: 239).

Thus, for theoretical reasons it is desirable to relativize our outcome measures as well as our predictor measures. We develop and use weighted percentile crime scores for the beginning and end of the decade. These measures capture essentially the same information as raw crime rates. The rank-order correlation between relative crime measures and raw crime rates or logged crime rates is 1.0 except when adjusting for ties.

**Linking Ecological Factors to Theories**

Relative deprivation theory suggests that decreases in the relative status of a neighborhood will be linked most strongly to increases in relative violence levels. Declining relative status may increase the residents' sense of injustice. These economic changes will be tied to other changes in neighborhood structure, such as the proportion of married-couple households (Sampson, 1987) and homeownership levels, and are thus inevitably confounded with those other changes. Nonetheless, it is the economic change itself that, according to this view, should be most strongly linked with increasing disorder.

By contrast, a social disorganization perspective highlights the role of changes in stability or racial composition as facilitators of increasing relative disorder levels. Increases in the proportion of rental households or decreases in married-couple households would be more important than economic changes per se because the former more clearly imply higher turnover levels and weaker local social networks.

Nonetheless, economic changes may, in a particular context, be associated with increasing diversity of the community population, and such diversity has been coupled with weaker informal social control (Maccoby et al., 1958). This can happen in gentrifying neighborhoods, where increasing income levels are associated with increasing diversity of the local population as immigrants and less well-to-do long-term residents coexist (Covington and Taylor, 1988). Despite these considerations, however, the social disorganization
perspective expects stability change and racial change, not economic change, to be most strongly associated with disorder changes.

**URBAN CHANGES IN THE 1970's**

Our specific hypotheses need grounding in the historical context of urban neighborhood change in the 1970's. Two major trends were emerging underclass neighborhoods, or further entrenchment of neighborhoods in that position, and the appearance of gentrifying neighborhoods.

**THE EMERGING UNDERCLASS**

Poverty increased dramatically in the 1970's and became more urbanized. From 1969 to 1982 the number of poor people in metropolitan areas increased by 62%, and the number of poor central-city blacks increased by 74%. As Wilson and Aponte (1985: 238) observed “the social dislocations related to poverty... reflect a sharply uneven distribution by race”; “a ghetto underclass has emerged and embodies the problems of long-term poverty and welfare dependency” (p. 243). The “deeper 'ghettoization,' and solidification of high levels of poverty” (p. 247) indicate an emerging urban black underclass during this period (Wilson, 1987). Hence, the increasing isolation of the black underclass might be expected to result in increases in the sense of deprivation and, perhaps, more violent crime.

These national-level trends were reflected in Baltimore City neighborhood changes during the decade. The gap between the most and the least well-off neighborhoods did increase during the decade (Taylor, 1983). Low status, usually minority neighborhoods lost earning power, as reflected in increased poverty and unemployment levels, relative to the better-off, predominantly white neighborhoods.

Based on findings from other cities (e.g., Moore et al., 1973; Taub et al., 1984), the Baltimore neighborhoods most likely to become increasingly underclass during the period would be those inner-city, black neighborhoods with filtered-down, largely rental, worn-out housing stock, that have been predominantly black for at least two decades.

**GENTRIFYING NEIGHBORHOODS**

During the 1970's many neighborhoods in Baltimore, as in other major U.S. cities, experienced gentrification (Covington and Taylor, 1988; Taylor and Covington, 1987; Taylor and Webb, 1982). Some two dozen neighborhoods experienced dramatic increases in relative house value, and these changes were associated with the population changes indicative of gentrifying areas: increasing managerial-professional work forces and increasing educational levels.

But, in Baltimore, as elsewhere, the “reality” of the gentrifying areas was
different from the popular view. First, before they gentrified, these areas were unstable, relatively low-income, relatively high-crime areas (Covington and Taylor, 1988). Second, by the end of the decade they were still diverse and had extensive renter and low-income populations (Covington and Taylor, 1988; DeGiovanni and Paulson, 1984; Lee and Mergenhagen, 1984). The areas were by no means "made over" into middle-income, stable areas; rather, they evidenced continuing diversity of both housing stock and immigrants (Covington and Taylor, 1988). Third, high levels of social conflict have been observed in gentrifying areas in several cities (McDonald, 1986). The sources of conflict have ranged from concern over displacement and increased taxes, to plain resentment (Barry and Derevlany, 1988).

OTHER SETTING CONDITIONS IN BALTIMORE

The two major ecological changes described above constitute our main focus. Their import is better understood if considered in the context of other changes specific to Baltimore.

During the 1970's the bulk of the major racial changes in Baltimore occurred in the older suburbs ringed the city (Goodman and Talalay, 1981) as middle-income, black households moved out of the outer-city neighborhoods into the inner suburban ring. Racial changes in the 1970's were much less evident than during the 1960's, when scores of neighborhoods in the northwest section of the city and along the York-Harford-Belair corridor experienced sizable racial change. The racial changes of the 1970's were more subtle (Taylor and Talalay, 1981). Several predominantly black neighborhoods continued the process of resegregation, changing from almost all black to all black, which may reflect an uninterrupted "filtering down" process that is typical of older, inner city, minority neighborhoods (Wilson and Aponte, 1985). A dozen or so neighborhoods integrated in 1970 were predominantly black by 1980, although another 15 neighborhoods in the northeast section of the city, legislatively protected against certain real estate practices, remained integrated throughout the decade.

In terms of stability or family status, gentrifying neighborhoods experienced increasing homeownership levels, but they were not "made over" into completely homeowner areas (Covington and Taylor, 1988; Taylor, 1983: Table 4). Some moderate-income, minority neighborhoods in the northwest sector also experienced significant increases in homeownership. In the city overall, there was a substantial drop in married-couple households (down almost 14%), and some groups of neighborhoods experienced even more sizable drops.

HYPOTHESES AND RATIONALES

Impoverished, inner-city, minority neighborhoods experiencing further
changes in ecology and violence — 561

decline—indicated by declining relative status and stability—should also experience increasing relative violence. The amount of increasing violence should be associated with the amount of decline.

Which change dimension is more closely linked to violence changes depends on the theoretical perspective. Relative deprivation suggests that declines in relative status will be most strongly linked to violence changes. Increased unemployment and poverty amplify family disruption, which Sampson (1987) has linked to violence at the city level.

By contrast, a social disorganization perspective suggests that declines in stability or familism will be most strongly linked to increasing violence. Decreased stability or familism, as indicated by lower proportions of married-couple households and home ownership, increases anonymity, thereby impeding the development of local “standards” or informal social control (Greenberg and Rohe, 1986; McKenzie 1968 [1921]). Such laxity may be more strongly linked to increasing aggravated assault levels than to increasing homicide levels. Thus, stability changes might be more strongly linked to changing levels of the former crime.

In gentrifying neighborhoods, increasing relative status and increasing relative stability levels should also be linked to increases in relative violence. This linkage is keyed to the increasing diversity evident in reinvestment areas (Covington and Taylor, 1988; DeGiovanni and Paulson, 1984). Which ecological change will be more strongly connected to the disorder change depends on the theoretical lens used.

Relative deprivation theory suggests that status change, as compared with stability change, will be more strongly linked to violence change. The larger the relative status change, the greater the class discrepancy between in-migrants and longer term residents, and the greater relative deprivation experienced by the latter.

A social disorganization framework suggests that relative stability change may be more important than status change, but not for the usual reasons. Increasing owner-occupancy levels usually suggest increasing informal social control. But in these areas, many new in-migrants are younger professionals with no children and “don’t stay home” life-styles, and/or their households may include two full-time wage earners (Covington and Taylor, 1988; Taylor and Covington, 1987). There are thus fewer “eyes on the street” (Jacobs, 1961). And, further, since gentrification proceeds piecemeal and gentrifiers do not completely make over the neighborhood, increasing ownership levels suggest more diversity and thus less informal social control.

SPECIFYING THE ECOLOGICAL FRAMEWORK

Examinations of ecology and violence have not yet considered the period 1970–1980. Links between ecological change and delinquency change are
specific to a particular historical period. Ties between ecological change and disorder during this period may assume a form different from the earlier linkages or may be significantly attenuated or strengthened.

Research on the linkage between ecological change and delinquency change has been undifferentiated to date. The possibility that the linkage varies across types of neighborhoods has not been examined. Such an oversight has been understandable. It was important to establish first that there was any connection at all.

It is well established now that different types of neighborhoods change in different ways (Taub et al., 1984). Hunter (1974b; see esp. Fig. 1), for example, found that whether a community changed from high to low family status (or vice versa), or from high to low economic status (or vice versa) between 1930 and 1960 was largely a function of the community's initial family status and economic status. He classified neighborhoods into one of four types (high family, high economic; high family, low economic; and so on). He found that within each type of neighborhood, if a neighborhood did change its position in this fourfold classification, it was most likely to change in one particular direction. Or, to state the point more theoretically, ecologists have recognized that processes of succession and competition between communities are determined in part by how a population acts on its own community (Berry and Kasarda, 1977: 12; Catton, 1984: 402–403).

Synthesizing these considerations suggests that how a neighborhood is influenced by change will depend on how much change is experienced, the nature of the change, and the initial ecological position of the neighborhood in the overall urban mosaic (Hunter, 1976). Naturally, initial position is probably related to amount and nature of change. Some neighborhoods are more likely to experience certain changes (e.g., decline, reinvestment) than others.

In short, our research has points of general interest for human ecology. We investigate the hypotheses that (1) different types of neighborhoods experience different amounts of change, and (2) the links between changes in ecology and violence, in part because of the foregoing, are also contingent on type of neighborhood. We would expect violence to be more likely to increase in the neighborhoods experiencing more drastic change. As a neighborhood experiences more substantial redefinition of its role in the larger urban mosaic, violence increases. Thus, violence levels will be most likely to change in gentrifying neighborhoods and in inner-city, minority neighborhoods experiencing further decline.

SUMMARY

In sum, human ecological theory predicts that changes in disorderliness will be linked with amount of ecological change. Previous research using delinquency rates has amply demonstrated this point (e.g., Bursik, 1984,
1986a). We further specify this thesis, building upon recent findings that (a) different neighborhoods are likely to follow different pathways of change (Hunter, 1974b), and (b) the ecology-disorder processual linkage is contingent upon the specific historical context (Bursik, 1986a). More specifically, we suggest processual linkages between ecology and violence are contingent upon overall neighborhood structure at the beginning of the period in question, as well as historical context. We expand recent research by considering violence-based indices of disorder: murder and aggravated assault. Given the salient changes occurring in Baltimore neighborhoods—and elsewhere—during the 1970's, we anticipate increasing violence levels in older, almost exclusively minority neighborhoods as they become more solidly "underclass" niches (Wilson and Aponte, 1985), and increasing violence levels in gentrifying neighborhoods as social heterogeneity increases in these locations (Covington and Taylor, 1988; DeGiovanni and Paulson, 1984). Relative deprivation and social disorganization perspectives both predict the same "sign" for the ecological change-violence change linkage. But they differ in the ecological change factor highlighted; the former focuses on relative status changes, and the latter on changes in relative stability.

PRELIMINARY ANALYTIC CONSIDERATIONS

SPATIAL AUTOCORRELATION

Violence levels in a neighborhood and changes in violence levels, may be influenced, respectively, by violence levels and changes in violence levels in adjoining neighborhoods. Thus, to isolate the impact of ecology on violence within a neighborhood it is necessary to control for the influence of adjoining neighborhoods. There are several ways to control for such spatial autocorrelation (Cliff and Ord, 1973; Griffith, 1987) depending, in part, on one's level of measurement.2 We adopted the ordinary least squares (OLS) procedure for incorporating spatial structure.

For each neighborhood, the set of immediately adjoining neighborhoods was determined. The average violence level and average change in violence level of each set of neighborhoods adjoining the target neighborhood were determined. These figures were then entered as spatial terms in the appropriate regression.

MEASURES OF CHANGE

To measure violence change and ecological change, difference scores (1980

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2. With interval data there are two generic approaches to incorporating spatial structure: a maximum likelihood estimation (MLE) procedure and an OLS model with a spatial term (Doreian, 1981). Doreian (1981: 374–375) demonstrated in several examples that the two approaches gave essentially identical results. Under the MLE approach, slightly smaller standard errors were observed.
scores — 1970 scores) are inadequate because they are related to initial levels of a variable (Bohrnstedt, 1969). Less problematic and more generally accepted are residualized change scores (Bohrnstedt, 1969). That is, parameter $P_t$ at time $t$ is broken into two portions: $P_t = A + BP_{t-1} + e$. There is the portion of $P_t$ predictable from the score $P_{t-1}$ and the residual or error ($e$), i.e., the portion of $P_t$ not predictable from $P_{t-1}$. Following the assumptions of regression (if they are not violated), $e$ is uncorrelated with predicted scores and with $P_{t-1}$ scores. This residual represents, conceptually, unexpected change over the time period, i.e., redefinition of a neighborhood’s role on that parameter vis à vis other neighborhoods. It is “unexpected” in two ways. It was not predictable given a neighborhood’s initial level, nor was it predictable given the overall changes occurring in the neighborhoods during the period. (These overall changes determine the slope $B$.)

This approach is routinely accepted as one of the best methods for estimating change (Bohrnstedt, 1969; Bursik 1984, 1986a, 1986b; Bursik and Webb, 1982; Elliott and Voss, 1974; Heitgard and Bursik, 1987). Consequently, in our analyses of change, ecological variables and violence variables build on these residuals. The method is appropriate analytically, and conceptually, given our purposes.3

TYPING NEIGHBORHOODS

To determine neighborhood types at the beginning of the time period, we carried out a nonhierarchical k-means clustering analysis with a fixed number of clusters (Anderberg, 1973: Ch. 7) based on neighborhood profiles at the beginning of the time period. That is, neighborhoods were grouped according to similar profiles on the three factorial ecology dimensions of status, racial/ youth composition, and stability. Scores on the three dimensions were orthogonal, and so each dimension was weighted equally.

Some consider cluster analysis an atheoretical technique. This criticism seems directed not against cluster analysis per se, but rather against misinterpretation of resulting clusters. Nonhierarchical clustering can be used in several different ways (Anderberg, 1973: 18–19, 23), for example, to reveal underlying structures or regularities in the data or simply to provide summary statistics. It provides a classification scheme that may be more or less “meaningful”—in the sense that it reveals underlying regularities—but there

3. The information obtained from this approach is related to, but different from, what would be obtained in a lagged panel regression (1980 violence regressed on 1970 ecological indicators). A 1980 violence score has two components: the portion predictable from 1970 ($A + BP_{t-1}$) and the residual ($e_{t-1}$). The first portion correlates 1.0 with $P_{t-1}$. So, if $Y = $ violence and $X = $ an ecological indicator, the regression $Y = A + BX_{t-1} + e$ is related to the two regressions: $Y_{t-1} = A + BX_{t-1} + e$ and $e_{t-1} = A + BX_{t-1} + e$, where $e_{t-1}$ is obtained from the equation $e_{t-1} = Y_t - (A + BX_{t-1})$. It is not possible to estimate the two separate slopes (for $X_{t-1}$) from the one lagged regression.
is no one single "right" classification (Anderberg, 1973: 22). Similarly, there is no one single correct rotated factor matrix, because it depends on the variables included, the number of factors rotated, and the specified relationship between factors.

The clustering of neighborhoods represents the most parsimonious, straightforward way of identifying neighborhood types. Alternative ways of testing our hypotheses are much more cumbersome and would involve, for example, analysis of variance (ANOVA) with tests for specific three-way interactions and planned contrasts.

Given the precedent of typing neighborhoods, that different types of neighborhoods change in different ways (Hunter, 1974b), and our theoretical purpose of examining ecological-violence change links in certain classes of neighborhoods, nonhierarchical clustering of neighborhoods is fully appropriate. The emerging clusters are admittedly exploratory, but they are useful to the extent that they enable us to differentiate neighborhoods and to isolate the kinds of neighborhoods of central theoretical interest.

The clusters we use were adopted after trying solutions with different numbers of clusters specified. In each case the full list in each cluster was examined, as were means and variances on clustering dimensions. The final grouping used was judged most useful for our theoretical purposes.4

BACKGROUND ON DATA SETS AND MEASURES

The data set to be used includes 1970 and 1980 census measures for all of Baltimore City's 277 neighborhoods and 1970 through 1980 Part I crime data for these same neighborhoods.5 The neighborhood units used were empirically delineated by Taylor (Taylor et al., 1979) in collaboration with

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4. It is not possible, in strict terms, to determine the "reliability" or "validity" of the classification used because it is exploratory. But, the final groups obtained here corresponded closely to groups obtained, based on slightly different factorial ecology dimensions and with a different algorithm, in another analysis of 1970 Baltimore neighborhoods (Taylor, 1983).

In k-means clustering, the desired number of clusters is set larger than the number of groupings desired so that outliers are not "forced" into particular groups (Anderberg, 1973: 168, Fig. 7.3).

5. Twenty-six small "unorganized" areas, 7% of the overall city population, did not qualify as identifiable areas given our mapping procedures. Their exclusion in no way "biases" our analyses, but it may limit external validity to such settings (Cook and Campbell, 1979). As always, generalizability is a purely empirical affair.

We also excluded 16 public housing areas from our analyses. Urban sociologists have recognized that in the postwar era "contrived communities," (e.g., public housing sites) have emerged in many major cities (Suttles, 1972: Ch. 4). These "contrived" communities are different in numerous ways—physically and socially—from "natural" communities. This limitation on external validity in no way restricts the internal validity of our study;
Baltimore City Planning Department personnel in the late 1970's. Our mapping was used as the basis for the 1980 Neighborhood Statistics Program for Baltimore City, carried out by the Bureau of the Census, underscoring the acceptability of the procedure. The neighborhoods delineated do not overlap. Each neighborhood is an independent entity. The 1970 and 1980 census information and the Part I crime data were subsequently allocated to the neighborhoods.

We used two indicators of violence: aggravated assault, and murder and nonnegligent manslaughter. This enabled us to determine the generalizability of observed relationships across alternative measures of violence. Other researchers have also tapped into alternative indicators of violence besides homicide. Sampson (1987), for example, examined robbery and homicide. The two crimes, across all neighborhoods, correlated .76 at the beginning of the decade, but changes in the two types of violence were essentially independent ($r = .006$).

In creating crime rates, the average number of crimes per year, based on the crimes during 1970 and 1971, was used as the numerator for beginning-of-the-decade crime rates. Average number of crimes during 1979 and 1980 was used as the numerator for end-of-the-decade crime rates. The total population in the neighborhood was the denominator in calculating the rates.

Eighteen neighborhoods were extremely small in size, usually less than 300 persons. For these neighborhoods, it was not possible to allocate crime data rather, it probably enhances it given the extreme scores on status-relevant ecological variables in many public housing sites (Goodman, 1983).

6. This procedure relied largely on existing community organization boundaries to define neighborhood boundaries. These boundaries were clear-cut. Subsequent checks on the reliability and external validity of our procedure, as well as numerous conversations with 'local experts,' have confirmed the accuracy of our mapping procedure.

Of course, alternative mapping procedures (cf. Schuerman & Kobrin, 1986; Hunter, 1974b) could have been used, and the external validity of our results to neighborhoods mapped in a different fashion is not determined at this time.

7. This programming was carried out as part of a project completed for the Baltimore Mayor's Office Coordinating Council on Criminal Justice. Full details on the allocation procedure appear in Goodman and Taylor (1983: Ch. 3).

8. Using two-year averages for constructing the beginning and ending crime rates was deemed more advisable than using one-year figures because of increased stability. It was also deemed more advisable than using three-year rates because the correct denominator in constructing a crime rate for a neighborhood is likely to be further from the denominator based on census figures as one moves further from the beginning or the end of the decade. That is, the population in a neighborhood in 1972 might be considerably different from the population in 1970.

There has been considerable discussion of the appropriate denominators to use in constructing small area, urban crime rates, and different denominators result in different spatial distributions of crime rates (e.g., Harries, 1981). We chose to use the "traditional" denominator because it uses figures that are readily available to others who might wish to replicate our work and because it is of a general, all-purpose nature.
reliably from the reporting area to the neighborhood. Thus, the 18 neighborhoods were not included in the analyses.

For each crime, we converted the beginning and ending crime rates for the decade to a relativized measure—percentile crime scores. These percentile crime scores, based on the neighborhood crime rates, rank each neighborhood, relative to all other neighborhoods in the city, and take each neighborhood’s population size into account. Scores are computed by ordering the neighborhoods on the crime rate of interest and then determining where in that ordering each particular neighborhood is positioned.

For each ecological and crime parameter of interest, its 1980 (or end-of-the-decade) score was regressed on its 1970 (or beginning-of-the-decade) score and the resulting residual was used as the change measure. As noted, these change measures control for initial levels of each parameter and for overall, neighborhood-level changes occurring in the city during the decade. They capture “unexpected” change, that is, change reflecting the redefinition of the neighborhood’s role in the larger city-wide fabric (Bursik, 1986a: 42-43).

RESULTS

The analysis proceeded in the following stages. We conducted a principal components analysis of 1970 census data to define 1970 ecological dimensions. Based on profiles across three independent dimensions, neighborhoods were grouped into clusters. Resulting clusters were considered in light of our

---

9. This type of measure has recently been used, for example, by Choldin et al. (1980) in their assessment of suburban status instability. To be more specific, the crime percentile score is computed as follows:

\[
\text{Crime Percentile}_i = 100 \times \frac{\text{\text{Sum} (i = i - M) Population}_i}{\text{\text{Sum} (j = j - n) Population}_j}
\]

Population is the population in the ith lowest neighborhood, Population is the total population in all neighborhoods in the city (exclusive of public housing areas), M = the neighborhood of interest, and N = the number of neighborhoods examined. Thus, a neighborhood with the lowest aggravated assault rate in the city would have a crime percentile score of 0; the neighborhood with the highest rate would have a score approaching 100. A neighborhood with a crime score of 50 is a neighborhood whose crime rate is equal to or greater than the neighborhood crime rate experienced by 50% of the population in the city’s neighborhoods.

10. Except for ties, the rank-order correlation between the percentile crime score and logged crime rates is one (rspearman = 1.00) for aggravated assault and rspearman = .929 for murder at the beginning of the decade. The crime percentile scores reflect the relativistic orientation desirable given our human ecology framework. Tables cross-referencing the percentile crime distributions and actual crime distributions are available from the first author; or see Taylor and Covington (1987).
theoretical purposes, and differences in violence across clusters at the begin-
ing of the decade were examined.

Principal components analysis of the parameters of ecological change yielded three dimensions of change, and we examine these pathways of change. To determine if, as we have predicted, different types of neighbor-
hoods changed in different ways, ecological change scores were regressed on
beginning-of-the-decade neighborhood types. Changes in violence were also
regressed on beginning-of-the-decade neighborhood types to see if unexpected
changes in violence levels varied across neighborhood types. Most significant
to our theoretical purposes is the examination, cluster by cluster, of correla-
tions between ecological change and violence change.

1970 ECOLOGICAL STRUCTURE

The results of the principal components analysis of 1970 census-based
measures appear in Table 1. The three emergent dimensions conform gener-
ally to the structure that has been observed in other major cities at the tract
or community level (e.g., Hunter, 1971: Table 4). Component I measures
status, with educational level, relative house value, poverty, and vacant hous-
ing all loading heavily on the linear composite. It is reflected, compared with
other analyses of this dimension, so that higher scores indicate lower status.

Neighborhoods scoring high on component II have a higher proportion of
blacks in their population and/or a higher proportion of their population in
the very young age groups (0—5 or 6—13). The linkage between minority
population and very young population was also observed in 1960 in Chicago's
75 natural areas (Hunter, 1971: Table 4). The higher loadings of youths in
this analysis suggest that the coupling of minority and very youthful popula-
tions has strengthened over time, or is stronger in Baltimore than in Chicago.

Component III corresponds to the typical family, or stability, ecological
dimension. Neighborhoods with a higher proportion of married-couple
households and one-unit structures and higher ratios of owner-occupied/
renter-occupied housing units have higher scores on this composite.

IDENTIFYING NEIGHBORHOOD TYPES

Next, we clustered neighborhoods based on their profile across the three
factorial ecology dimensions. A nonhierarchical, k-means algorithm was
used (Wilkinson, 1986). A 15-group solution was requested.\textsuperscript{11} Table 2

\textsuperscript{11} Several different runs, each requesting different numbers of groupings, yielded the
same major groupings of neighborhoods, which were recognizable across the different solu-
tions. The main difference was in how "outlier" neighborhoods were treated. If a larger
number of groupings was requested, neighborhoods whose profiles were dissimilar from
others were allocated into their own grouping; if a smaller number was requested, they
were attached to a larger grouping.
**Table 1. Principal Components Analysis of 1970 Ecological Variables: Varimax-rotated Solution**

<table>
<thead>
<tr>
<th></th>
<th>Component</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Status</td>
<td>Minority/Youth</td>
<td>Stability</td>
<td></td>
</tr>
<tr>
<td>Percent 25 or Older Who</td>
<td>-.913</td>
<td>-.029</td>
<td>-.112</td>
<td></td>
</tr>
<tr>
<td>Completed Requirements for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School, but Have Not</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed Earned Credit for</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or More Years of College</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HSEDZ7P)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative House Value Rank</td>
<td>-.845</td>
<td>-.245</td>
<td>.178</td>
<td></td>
</tr>
<tr>
<td>(VALRANK7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Households Below the</td>
<td>.779</td>
<td>.406</td>
<td>-.163</td>
<td></td>
</tr>
<tr>
<td>Poverty Line (POVZ7P)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Vacant Housing Units</td>
<td>.715</td>
<td>-.106</td>
<td>-.384</td>
<td></td>
</tr>
<tr>
<td>for Sale, for Rent, or Boarded</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up (VACNTZ7P)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Aged 6-13 (A613Z7P)</td>
<td>.162</td>
<td>.837</td>
<td>.355</td>
<td></td>
</tr>
<tr>
<td>Percent Aged 0-5 (A05Z7P)</td>
<td>.029</td>
<td>.803</td>
<td>.031</td>
<td></td>
</tr>
<tr>
<td>Percent Black Population</td>
<td>.128</td>
<td>.765</td>
<td>-.258</td>
<td></td>
</tr>
<tr>
<td>(BLKZ7P)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent 1-unit Structures</td>
<td>.059</td>
<td>.179</td>
<td>.932</td>
<td></td>
</tr>
<tr>
<td>(PC1UNIT7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Owner-occupied Housing</td>
<td>-.425</td>
<td>-.270</td>
<td>.802</td>
<td></td>
</tr>
<tr>
<td>Units (OWNOCZ7P)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent Married-couple House-</td>
<td>-.631</td>
<td>-.002</td>
<td>.712</td>
<td></td>
</tr>
<tr>
<td>holds (PCMARRD7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lambda</td>
<td>4.35</td>
<td>2.34</td>
<td>1.31</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Largest loading for each variable is underlined.

presents the means and standard deviations of factorial ecology scores for the largest clusters of neighborhoods. Each cluster was then examined to determine which specific neighborhoods it included and the characteristics and location of those neighborhoods.

Given our theoretical intent, we are most interested in two types of neighborhoods which experienced the most major changes during the 1970’s—gentrifying neighborhoods, and older, inner-city, minority neighborhoods that became more entrenched in an underclass status.
### Table 2. Mean Scores on 1970 Factorial Ecology Dimensions by Cluster

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Low Status (LOSTAT70)</th>
<th>Minority/Youth (MINKID70)</th>
<th>Stability (STABLE70)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n = 39)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.71</td>
<td>-0.44</td>
<td>0.07</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.40</td>
<td>0.38</td>
<td>0.30</td>
</tr>
<tr>
<td>2 (n = 9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.25</td>
<td>-1.65</td>
<td>-2.24</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.63</td>
<td>0.72</td>
<td>0.81</td>
</tr>
<tr>
<td>3 (n = 26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.47</td>
<td>0.83</td>
<td>0.46</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.43</td>
<td>0.34</td>
<td>0.31</td>
</tr>
<tr>
<td>4 (n = 20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.85</td>
<td>1.22</td>
<td>0.20</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.49</td>
<td>0.43</td>
<td>0.32</td>
</tr>
<tr>
<td>5 (n = 27)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.84</td>
<td>1.01</td>
<td>-0.61</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.48</td>
<td>0.54</td>
<td>0.32</td>
</tr>
<tr>
<td>7 (n = 11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.90</td>
<td>-0.45</td>
<td>-0.18</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.58</td>
<td>0.47</td>
<td>0.57</td>
</tr>
<tr>
<td>8 (n = 28)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>0.82</td>
<td>-0.45</td>
<td>0.95</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.36</td>
<td>0.49</td>
<td>0.38</td>
</tr>
<tr>
<td>10 (n = 23)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.43</td>
<td>-1.06</td>
<td>0.82</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.35</td>
<td>0.34</td>
<td>0.33</td>
</tr>
<tr>
<td>11 (n = 11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.85</td>
<td>-1.29</td>
<td>-1.35</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.38</td>
<td>0.39</td>
<td>0.63</td>
</tr>
<tr>
<td>12 (n = 7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.55</td>
<td>-0.40</td>
<td>1.71</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.40</td>
<td>0.39</td>
<td>0.37</td>
</tr>
<tr>
<td>14 (n = 12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>1.33</td>
<td>0.95</td>
<td>-1.04</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.56</td>
<td>0.30</td>
<td>0.49</td>
</tr>
<tr>
<td>15 (n = 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>-0.42</td>
<td>0.55</td>
<td>-2.08</td>
</tr>
<tr>
<td>S.D.</td>
<td>0.75</td>
<td>0.25</td>
<td>0.52</td>
</tr>
</tbody>
</table>
POTENTIAL GENTRIFYING NEIGHBORHOODS

Due to relatively low status, low levels of stability, nature of the housing stock, and proximity of several neighborhoods in the clusters to major educational institutions or other attractions, clusters 2 and 7 were, we believed, most likely to have gentrified over the decade (Taylor, 1983). Low status meant the housing was a bargain, and low stability betokened a displaceable population. Many of the neighborhoods in these two clusters did indeed gentrify significantly over the decade, as indicated by dramatic increases in relative house value and changes in educational levels (Covington and Taylor, 1988; Taylor and Webb, 1982).

MINORITY, INNER-CITY, UNDERCLASS NEIGHBORHOODS

Cluster 14 comprised 12 neighborhoods that were predominantly rental, all black, predominantly black for at least two decades, and located close to the center of the city, on both the eastern and western portions. Education, house price, and owner occupancy rates were lower in this cluster than in any of the others. Poverty and unemployment levels were quite high. The neighborhoods in cluster 4 also conformed to this pattern, although not as clearly as ones in cluster 14. In cluster 4 status and stability were not quite as low. But again, the bulk of the neighborhoods in cluster 4 were minority, inner-city neighborhoods.

OTHER TYPES

Clusters 1, 8, and 10 comprised two types of predominantly white, relatively stable neighborhoods. Cluster 1 included a large number of outer-city neighborhoods, and clusters 8 and 10 included ethnic and/or "southern white" neighborhoods closer to the city’s core.

Clusters 3 and 5 contained predominantly black neighborhoods, many of which “turned over” during the 1960’s, in the northwest and York-Harford-Belair sections of the city. Cluster 5 appeared less stable but of higher status than cluster 3.

Cluster 15 comprised just five neighborhoods, all located in close proximity to the most disadvantaged minority neighborhoods. These neighborhoods were black or integrated in 1970 and somewhat above average in status.

NEIGHBORHOOD TYPES AND BEGINNING-OF-THE-DECADE VIOLENCE LEVELS

Each neighborhood’s cluster was represented by a dummy variable, save
for the reference string. The largest cluster of neighborhoods, which happened to contain predominantly white neighborhoods, was chosen as the reference string.\textsuperscript{12}

Controlling for murder levels in immediately adjoining neighborhoods, and using the largest white cluster (cluster 1) as the reference string, several neighborhood types scored significantly higher on beginning-of-the-decade murder levels: cluster 4 (p < .01; B = 20.7); cluster 5 (p < .01; B = 15.1); cluster 7 (p < .002; B = 28.3); and cluster 14 (p < .001; B = 38.1).\textsuperscript{13} Overall, neighborhood types "accounted" for 41% of the variation in beginning-of-the-decade murder scores. The spatial autocorrelation parameter accounted for an additional 17% of the variation. (Total R\textsuperscript{2} = .58 (F(12, 192) = 22.12; p < .001).)

Controlling for aggravated assault levels in immediately adjoining neighborhoods, and using the largest (predominantly white) cluster as the reference string, several clusters of neighborhoods scored significantly higher on beginning-of-the-decade aggravated assault levels. Again, cluster 14, with its more filtered down, minority neighborhoods, scored highest above the reference string (B = 26.6; p < .001). Also scoring higher were clusters 2 (B = 18.4; p < .02), 4 (B = 19.5; p < .01), and 7 (B = 23.3; p < .01). Neighborhood types "accounted for" 39% of the variation in assault levels, and the spatial parameter accounted for 29%. (Total R\textsuperscript{2} = .68 (F(12, 192) = 34.5; p < .001).)

Thus, at the beginning of the decade, minority, inner-city neighborhoods, which had been predominantly black at least a couple of decades and had the greatest potential of becoming increasingly underclass in nature, had the highest levels of murder and aggravated assault. Of the two clusters of moderate-to-high status black neighborhoods, which had experienced succession during the preceding decade (clusters 3 and 5), one was significantly higher than the reference string, and the other was marginally higher (p < .07), on murder. On aggravated assault, two clusters (2 and 7) with numerous soon-to-gentrify neighborhoods showed significantly higher levels than the reference string. One of these clusters was significantly higher on murder as well; the other cluster was only marginally higher (p < .07). For both crimes, violence levels were strongly influenced by violence levels in immediately adjoining neighborhoods. Emerging underclass neighborhoods were high violence areas at the beginning of the decade, as were soon-to-gentrify neighborhoods.

\textsuperscript{12} Resulting B weights for each dummy are not sensitive to number of neighborhoods in the cluster and indicate that cluster's mean score above or below the reference string if dummies for all groups save the reference string are entered. The constant indicates the reference string's mean score.

\textsuperscript{13} Using the largest black cluster of neighborhoods as the reference string resulted in essentially the same results for murder and, later, for aggravated assault.
STRUCTURE OF ECOLOGICAL CHANGE 1970–1980

The results of three-factor, varimax rotated principal components analysis of 1970–1980 ecological change parameters appear in Table 3. Fourth and subsequent components were noticeably smaller than the first three (by scree analysis) and thus were not rotated. Component I indicated changes in status. The standardized variable reflecting changes in relative house price loaded highest on the component. Changes in educational and professional employment levels also loaded strongly on this component. Neighborhoods scoring positive on this component experienced unexpected increases in relative house value and educational and professional employment levels, and unexpected decreases in unemployment and teen populations. This component compares closely, although it includes many more variables, with the status change factor observed by Hunter (1971: Table 6B) in his three-factor analysis of change in Chicago communities for the period 1950–1960.

Component II indicated increasing minority and very young populations and decreasing elderly and soon-to-be elderly populations. Neighborhoods scoring positively on this component had older, nonminority households replaced by minority households with young children. The component compares closely with the increasing minority-increasing very young component of change observed by Hunter (1971: Table 6B, also p. 440) in the 1950's in Chicago communities.

Component III suggested increasing stability or changes in family status. Neighborhoods scoring positively on this dimension experienced unexpected positive changes in the proportion of owner-occupied housing units, one-unit structures, middle-aged households, relative income rank, and married-couple households. It does not compare closely with the family status change dimension identified by Hunter (1971: Table 6B) for Chicago communities during the 1950's, which included single-family dwellings and children under five years. Given the major changes in family structure since that time (Cherlin, 1981), this discrepancy is not surprising.

ECOLOGICAL CHANGES AND CHANGES IN VIOLENCE

We proceeded as follows in establishing the connection between changes in ecological structure and changes in violence. On a cluster-by-cluster basis, we correlated ecological change parameters with changes in violence levels. The correlations for murder and nonnegligent manslaughter appear in Table 4, for aggravated assault in Table 5. All correlations shown are partials, after controlling for the appropriate violence change in adjoining neighborhoods. Except for cluster 2, which is of central interest, we do not show correlations for clusters including fewer than 10 neighborhoods.  

14. Across all clusters, the three ecological change dimensions are independent. But
Table 3. Principal Components Analysis of Ecological Change

<table>
<thead>
<tr>
<th>Component</th>
<th>Status (I)</th>
<th>Minority/Youth (II)</th>
<th>Stability (III)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentile House Rank (HRANKRES)</td>
<td>.797</td>
<td>-.002</td>
<td>-.084</td>
</tr>
<tr>
<td>Percent 25 or Older Who Earned Credit for One Year or More of College (GTHSRES)</td>
<td>.787</td>
<td>.243</td>
<td>.085</td>
</tr>
<tr>
<td>Percent 16 or Older Who Are Managers or Professionals (MGRPRESRES)</td>
<td>.767</td>
<td>.019</td>
<td>.080</td>
</tr>
<tr>
<td>Percent Unemployed (UNEMPRES)</td>
<td>-.430</td>
<td>.271</td>
<td>-.086</td>
</tr>
<tr>
<td>Percent 25 or Older Who Completed Requirements for High School Degree, but Have Not Earned Credit for One or More Years of College (HSEDRES)</td>
<td>-.365</td>
<td>.127</td>
<td>-.114</td>
</tr>
<tr>
<td>Percent 65 or Older (A65PLRES)</td>
<td>-.024</td>
<td>-.778</td>
<td>-.051</td>
</tr>
<tr>
<td>Percent Aged 60-64 (A6064RES)</td>
<td>-.090</td>
<td>-.699</td>
<td>.068</td>
</tr>
<tr>
<td>Percent Black Population (OKBLKRES)</td>
<td>-.174</td>
<td>.590</td>
<td>-.144</td>
</tr>
<tr>
<td>Percent Aged 6-13 (A613RES)</td>
<td>-.224</td>
<td>.589</td>
<td>-.006</td>
</tr>
<tr>
<td>Percent Aged 0-5 (A05RES)</td>
<td>.054</td>
<td>.488</td>
<td>-.441</td>
</tr>
<tr>
<td>Percent Aged 14-17 (A1417RES)</td>
<td>-.443</td>
<td>.461</td>
<td>.274</td>
</tr>
<tr>
<td>Percent Households Below Poverty Line (POVRES)</td>
<td>-.288</td>
<td>.413</td>
<td>-.342</td>
</tr>
<tr>
<td>Percent Vacant Housing Units for Sale, Rent, or Boarded Up (VACNTRES)</td>
<td>.152</td>
<td>.240</td>
<td>.003</td>
</tr>
<tr>
<td>Percent Owner-occupied Housing Units (OWNOCRES)</td>
<td>.103</td>
<td>.040</td>
<td>.800</td>
</tr>
<tr>
<td>Percent 1-unit Structures (PCIUNITRES)</td>
<td>.040</td>
<td>.021</td>
<td>.680</td>
</tr>
<tr>
<td>Percent Aged 35-49 (A3559RES)</td>
<td>-.257</td>
<td>-.078</td>
<td>.611</td>
</tr>
<tr>
<td>Percent Married Households (PCMARRRES)</td>
<td>.316</td>
<td>-.203</td>
<td>.551</td>
</tr>
<tr>
<td>Percentile Income Rank (INKRNRRES)</td>
<td>.423</td>
<td>-.014</td>
<td>.547</td>
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<tr>
<td>Lambda</td>
<td>3.62</td>
<td>2.38</td>
<td>2.11</td>
</tr>
</tbody>
</table>

NOTES: Largest loading for each variable is underlined. All ecological change measures were derived from 1970 and 1980 census data. Scores for each variable were residualized 1980 measures, controlling for 1970 levels of the variable.

the correlations among the three vary somewhat from cluster to cluster, which means we have correlated predictors of violence change. Multiple regression was not feasible, however, given the small number of neighborhoods in most clusters, particularly the ones of key interest (14, 2, 4, and 7).
### Table 4. Links of Ecological Change with Changes in Violence: Murder

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Status Increase</th>
<th>Minority, Youth &amp; Poverty Increase/Elderly Decrease</th>
<th>Stability Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (n = 39)</td>
<td>.00</td>
<td>.17</td>
<td>-.02 (-.03)(^a)</td>
</tr>
<tr>
<td>2 (n = 9)</td>
<td>.25</td>
<td>.13</td>
<td>.44 (.31)(^a)</td>
</tr>
<tr>
<td>3 (n = 26)</td>
<td>-.30</td>
<td>.10</td>
<td>.02</td>
</tr>
<tr>
<td>4 (n = 20)</td>
<td>.39 (.31)(^a) (.06)(^b)</td>
<td>-.09</td>
<td>-.30 (-.38)(^a) (.10)(^b)</td>
</tr>
<tr>
<td>5 (n = 27)</td>
<td>.08</td>
<td>.08</td>
<td>-.06</td>
</tr>
<tr>
<td>7 (n = 11)</td>
<td>.42 (.25)(^a)</td>
<td>-.71 (-.41)(^a)</td>
<td>.62 (.48)(^b)</td>
</tr>
<tr>
<td>8 (n = 28)</td>
<td>-.33 (-.23)(^a)</td>
<td>.07</td>
<td>-.26</td>
</tr>
<tr>
<td>10 (n = 23)</td>
<td>.32</td>
<td>.19</td>
<td>-.15</td>
</tr>
<tr>
<td>11 (n = 11)</td>
<td>.10</td>
<td>-.17</td>
<td>-.42 (-.70)(^a)</td>
</tr>
<tr>
<td>14 (n = 12)</td>
<td>.06 (-.53)(^a)</td>
<td>-.16</td>
<td>-.39 (-.30)(^a)</td>
</tr>
</tbody>
</table>

**NOTE:** Correlations are partials controlling for spatial autocorrelation. Correlations for each cluster after outlier(s) were removed appear in parentheses. An outlier, unless otherwise noted, was a neighborhood with the most extreme score on the predictor variable and that was separated from the nearest data point in the plot by at least one standard deviation.

\(^a\) Partial after removing one outlying cluster member.

\(^b\) Partial after removing two outlying cluster members.

### Outliers

Past ecological research on ecology and disorder has found that a single outlier can have a major influence on the results. (See Bursik’s 1986a discussion of Bursik and Webb, 1982). Therefore, we attended to outlying neighborhoods.

From an ecological view these outliers are inherently interesting because they may suggest additional factors are at work (Bursik, 1986a: 44). In two of the gentrifying clusters, for example, we identified outliers that were neighborhoods in which the city sold “dollar houses” during the 1970’s. “Dollar houses” were housing units, usually abandoned, sold by the city to new owners for a dollar. The city arranged low cost improvement loans. The buyer agreed to have the unit in habitable condition within a specified time period.


<table>
<thead>
<tr>
<th>Cluster</th>
<th>Status Increase</th>
<th>Stability Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.12</td>
<td>.46 (.24)*</td>
</tr>
<tr>
<td></td>
<td>.50</td>
<td>.23 (.52)*</td>
</tr>
<tr>
<td></td>
<td>.21</td>
<td>.17</td>
</tr>
<tr>
<td></td>
<td>-.27</td>
<td>.42 (.14)*</td>
</tr>
<tr>
<td></td>
<td>-.23</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>-.59 (-.67)*</td>
<td>.75 (.83)*</td>
</tr>
<tr>
<td></td>
<td>.11</td>
<td>-.13</td>
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<tr>
<td></td>
<td>-.03</td>
<td>.00</td>
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<tr>
<td></td>
<td>.07</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>-.17</td>
<td>-.48 (-.52)*</td>
</tr>
</tbody>
</table>

NOTE: Correlations are partials controlling for spatial autocorrelation. Correlations for each cluster after outlier(s) were removed appear in parentheses. An outlier, unless otherwise noted, was a neighborhood with the most extreme score on the predictor variable and that was separated from the nearest data point in the plot by at least one standard deviation.

* Partial after removing one outlying cluster member.

b Partial after removing two outlying cluster members.

In several cases, we found a single outlier within a cluster. An outlier was defined as a neighborhood separated from the nearest other cluster member by at least one standard deviation on the predictor variable. Correlations were recalculated after deleting the outlier. We also looked on scatterplots for outliers on the dependent variable that would have undue influence on the partial slope. In several instances partials were recalculated after deleting the outliers.

Outliers can be of two sorts. An outlying neighborhood may be distant from but "in line with" other similar neighborhoods, which suggests that the neighborhood was experiencing the same dynamics as other cluster members, but at an "accelerated" pace. Alternatively, an outlying neighborhood may be "off the line" formed by other neighborhoods in the scatterplot. Such positioning suggests, for one reason or another, that the neighborhood was
excepted from the processual dynamics experienced by the other cluster members. The exclusion of an outlier and reestimation of a correlation is more easily justified in this case than in the former case.

INNER-CITY, LOW-STATUS, MINORITY NEIGHBORHOODS

Given the small size of the clusters, we concentrate in our presentation on correlations > positive or negative .30, in the view that these moderate size effects (Cohen and Cohen, 1983) are worthy of attention.

Murder. Cluster 14 comprised almost wholly black neighborhoods in the inner city that had been predominantly black for at least a couple decades and were of very low status. These neighborhoods were prime sites for further entrenchment into Wilson’s “urban underclass.”

The bulk of these neighborhoods experienced further declines in status during the decade. A very noticeable “deviant” neighborhood, Lincoln Park (pseudonyms are used for all neighborhoods), was close to a gentrified, predominantly white neighborhood. It experienced significant gentrification during the period. House value went from less than $1,000 (1970 dollars) in 1970 to over $49,000 (1980 dollars) by 1980. This neighborhood’s component score on status change was > 3.5. Excluding Lincoln Park, and controlling for spatial autocorrelation, the link between declining status and increasing murder levels was — .53.15

On stability change, neighborhoods in this cluster were about evenly split between positive and negative scores. Nonetheless, murder levels increased in neighborhoods in which stability declined (r = —.39). This relationship was only slightly weakened when one neighborhood (Vernon Hill) with a very high positive score on stability change was deleted; r = —.30.

Thus, in this cluster of severely disadvantaged minority neighborhoods, the extent of decline, as indicated by unexpected decreases in status and stability, was accompanied by moderate-sized increases in murder levels. In other words, as these neighborhoods shifted their position in the overall urban fabric to positions of even more extreme low status and stability, serious disorder levels increased. Murder changes in this cluster appeared more closely linked to status than to stability change, which lends more support to the relative deprivation than to the social disorganization explanation.

Although not as extremely impoverished and unstable as the neighborhood in cluster 14, the minority neighborhoods in cluster 4 were also of low status, albeit more stable. Almost all the neighborhoods in this cluster experienced decreasing status. Partials were recalculated after excluding two

15. If we delete another neighborhood scoring slightly over 2 on the status change dimension (Vernon Hill), the correlation is reduced somewhat further to — .29. This neighborhood, however, does "line up" with others on the plot. Thus, although it was an outlier, it was not deviant from the pattern of the other cluster members.
neighborhoods. One neighborhood, Earnwood, was close to gentrifying neighborhoods near Johns Hopkins University and scored a full standard deviation higher than the nearest other neighborhood in the cluster on status change. Another neighborhood, Montrose, a "home base" for a very active local social worker and leader emerging on the city's political scene during the 1970's, was more than 35 points lower than any other neighborhood on the outcome. The partial correlation of .39 dropped to .31 after excluding Earnwood; dropping Montrose resulted in a partial correlation between status and murder of essentially zero (.064), controlling for adjoining changes in murder. Perhaps the moderate levels of stability in these neighborhoods at the beginning of the decade "buffered" these neighborhoods from experiencing increasing disorder as status declined.

On stability, although many neighborhoods in cluster 4 experienced unexpected decreases, the losses were not as sizable as in cluster 14. The partial correlation between changing stability and murder was essentially zero (.10) once an extreme scorer on the ecological change dimension was removed and an extreme scorer (Montrose) on the outcome was removed. The removal of the latter can be questioned, however, inasmuch as this neighborhood did experience increasing stability as well as decreasing murder. Thus, although an "outlier," it was not deviant. Leaving Montrose in, the correlation was a moderate — .38.

In sum, in the lowest status, least stable, minority neighborhoods (cluster 14), further slippage in status and stability levels, relative to the other neighborhoods in the city, was associated with increasing relative levels of serious disorder. In somewhat more stable, inner-city minority neighborhoods (cluster 4), the relationships did not appear for status change. But, in this cluster, a case can be made for a link between slipping stability and increasing violence, depending on which "outliers" one chooses to exclude. Perhaps, generally, the reason for the attenuation of these relationships in the latter cluster is that the member neighborhoods were more stable compared with neighborhoods in cluster 14, at the beginning of the decade. Stability perhaps "buffered" the effects of subsequent declines, and these unexpected drops in status and stability were not as sizable as in cluster 14. In cluster 14 the patterns clearly support relative deprivation arguments more strongly than social disorganization ones; in cluster 4 both arguments may be supported.

*Aggravated Assault.* In cluster 14 a strong relationship between declining status and increasing assault was observed (— .63). Eliminating Lincoln Park for its extreme score on status changed the correlation to — .31. Also, removing Vernon Hill for its extreme score on status change further reduced the correlation to — .15. These eliminations are debatable, however. Even though the deleted neighborhoods were extreme on the status dimension, they
"lined up" perfectly with the other neighborhoods on the plot. They were outliers, but not deviant.

More clear-cut was a sizable negative relationship between stability change and assault change (−.48). The elimination of an outlying neighborhood only strengthened the connection (−.52).

In cluster 4 the modest negative relationship between status change and assault change (−.24) was rendered nil (−.04) after Earnwood was eliminated. Increasing minority and youth populations and decreasing elderly populations were associated with modest decreases in assault levels (−.27). A positive relationship between stability change and assault change (.42) was diminished almost completely after removing one small neighborhood (Benjamintown Road) with a very extreme score on increasing stability.

In sum, in the lowest status, least stable minority neighborhoods, depending on which outliers we view as "legitimate" to exclude, the evidence supports a link between declining status and increasing assault. The link between declining stability and increasing assault was just as strong, but was not mutable, that is, it did not attenuate after the removal of an outlying neighborhood. In the low-income, but more stable, minority neighborhoods, cluster 4, the same relationships did not emerge. In general, in cluster 4 more moderate levels of stability "buffered" the low status, minority neighborhoods from experiencing increasing assault levels as status and stability declined. So, the different patterns between the two clusters were consistent across the two outcome measures. Theoretically, the role of stability in cluster 14 suggests that social disorganization, as compared with relative deprivation, arguments better explain unexpected changes in assault levels.

**GENTRIFYING NEIGHBORHOODS**

*Murder.* Clusters 2 and 7 contained numerous neighborhoods that gentrified noticeably over the decade. In both clusters, status and stability changes were linked with murder changes. In cluster 2 increasing status was associated slightly with increasing murder levels (.25), falling below our .30 "cutoff," but increasing stability was associated with increasing murder levels (.44). The latter partial was attenuated only slightly (r = .31) with the removal of an outlying but nondeviant neighborhood, Lyndon Square. The city had sold numerous "dollar houses" during the 1970's in Lyndon Square, which is close to several public housing projects and the Inner Harbor area.

The same positive links emerged in cluster 7. Increasing status (r = .42; r = .25 after dropping an outlying, but nondeviant neighborhood that was also a "dollar house" site in the 1970's) and increasing stability (r = .62; r = .48 after dropping two outliers) were both linked to increasing murder levels.

In cluster 7 a change on the minority/youth/elderly dimension was negatively linked to murder changes. Neighborhoods scoring positively on this
change vector tended to score lower on murder change than neighborhoods posting an unexpected drop.

Thus, in both clusters, murder is more strongly linked to changes in stability than to changes in status. In these two clusters, of course, these two change dimensions are closely correlated. This correlation “must” occur given the historical changes we are discussing, and it does confound attempts to separate specific effects. Nonetheless, it appears that social disorganization rather than relative deprivation arguments better explain the pattern of murder changes for these neighborhoods.

Aggravated Assault. In both clusters there is a strong positive relationship between stability change and assault change (.52 in cluster 2 after removing Lyndon Square; .83 in cluster 7 after removing two outliers). In cluster 7 a positive link between status change and assault change emerges, and it is relatively insensitive to the removal of one outlier. 16 This outlying neighborhood, Rutherford Circle, was also a “dollar house” neighborhood in the 1970’s and is close to the Inner Harbor and several public housing projects. 17 Thus, in both clusters, as was the case with murder, increases in assault are more clearly linked to increasing stability than to increasing status.

At first glance, the observed pattern would seem to support social disorganization models more strongly than relative deprivation arguments. Other setting conditions, however, suggest that relative deprivation dynamics may have played some role in explaining changes in assaults. Several neighborhoods in these two clusters were in inner-city, very low-income locations, and in proximity to sizable pools of potential offenders. Moreover, in about a half dozen instances, neighborhoods in these clusters were areas where the city sold “dollar houses” to singles and couples, usually professionals, bent on rehabilitating and inhabiting the properties. In such locations the contrasts between haves and have-nots were and are extremely salient.

ECOLOGY-VIOLENCE LINKS IN OTHER NEIGHBORHOODS

In other clusters of neighborhoods, although the violence change-ecological change links varied considerably, none of the correlations—with one exception—exceeded the .30 cutoff for examination. Nor were the correlations in the other clusters as clearly patterned as the clusters discussed here. In other words, in neighborhood groupings that, due to their initial ecological position, did not experience major redefinition of their role during the period,

16. This neighborhood was a “nondeviant” outlier; it lined up very well with other neighborhoods in the plot.

17. In cluster 7 racial/youth change was also linked to assault change. Neighborhoods experiencing more noticeable integration, youth increase, and elderly decrease during the period experienced lower assault change scores. The negative relationship may reflect, in part, decreasing availability of elderly, vulnerable targets for street crime.
changes that did occur were not strongly connected with changes in violence. This confirms and extends the findings from earlier work (e.g., Bursik, 1984, 1986a) on delinquency rates that link rate of change to levels of disorderliness.

DIFFERENCES IN CORRELATION ACROSS CLUSTERS

For each ecological change dimension, and each violence outcome, we determined if the partial correlations, controlling for spatial autocorrelation, varied significantly across clusters (see Cohen and Cohen, 1983: 53–54). They did. In each case we computed the z tests comparing the two most different partials. All z scores were greater than 2.3, all p’s < .04.

DISCUSSION

LIMITS AND STRENGTHS

The results reported here are limited in several respects. We have examined links between violence and ecology changes in identifiable neighborhoods or subcommunities in one city during one decade. The external validity of these patterns to different decades, different cities during the same decade, neighborhoods identified using different procedures, or to different units of analysis is not known. It may or may not be low; as always, determining external validity is a purely empirical matter.

Turning to considerations of internal validity, the study is strong. Two independent indices of changes in violence were examined, and they yielded comparable patterns of correlation in the key clusters under investigation. In addition, we controlled for spatial adjacency effects throughout, so that the linkages observed reflect only variations in violence internal to the targeted neighborhoods and are independent of the variations in adjoining areas.

Considerations of the validity of statistical conclusions are somewhat beside the point since we did not sample neighborhoods from the population of Baltimore neighborhoods, and thus tests of statistical significance are, strictly speaking, inappropriate. And, in our cluster-by-cluster analysis of correlations, the small numbers suggest very low levels of statistical power. Consequently, in the latter analysis it was appropriate to ignore measures of statistical significance and instead concentrate on measures of effect size. We focused, therefore, on moderate size (r > ± .30) correlations, viewing them as “significant” in terms of size of relationship.

The study is strong on construct validity in two respects. The factorial ecology dimensions we identified—cross-sectional and dynamic—corresponded closely to structures observed in Chicago’s communities in the 1950’s (Hunter, 1971). Where differences did occur, they were straightforward discrepancies reflecting changes in the structure of the population since
that time. In addition, the clustering procedure provided groupings of neighborhoods corresponding closely to the neighborhood types of central theoretical interest—gentrifying and emerging underclass.

Our construct validity is limited in that our information is based on crimes reported to the police. Thus, we do not know if the victims (or offenders) were people living in the neighborhood where the crime occurred. And, there is the possibility of underreporting. Nonetheless, this weakness is inherent also in most other studies of ecology and violence (e.g., Messner, 1983; Sampson, 1987). Further, given the small ecological units in question, victim surveys would not yield reliable estimates (Skogan, 1981). And, finally, given the major nature of the crimes investigated, and the “rational” nature of crime reporting (Skogan, 1972), we seriously doubt whether our aggravated assault measure contains serious and biasing underreporting. The murder measure is unlikely to contain any underreporting.

IMPLICATIONS AND FURTHER INQUIRY

In a general vein, our results confirm that in the 1970’s, as has been observed in our major cities in earlier decades of this century, rapid levels of neighborhood change are problematic. As a neighborhood’s role in the larger urban fabric undergoes redefinition—as its position vis-à-vis other neighborhoods changes—disorder increases. But our findings also extend this general wisdom in several respects. First, the relationship holds even when the transformation in question is generally regarded as a positive development, as in the case of gentrification. Decline is not the only problematic type of neighborhood change. Second, to date, the work on neighborhood change and disorder has been limited largely to changes in delinquency rates. Our work extends the finding to alternate measures of disorder. We have moved from offender-based to offense-based measures, and the relationship still obtains. The people in these changing neighborhoods live amidst relatively higher levels of serious disorder.

Relative deprivation and social disorganization processes are both implicated in our pattern of findings. In the clearest emerging underclass cluster (14), status was more strongly connected with murder changes than was stability. But, in the case of assault changes, the reverse pattern obtained. In the case of gentrifying neighborhoods, stability was consistently more strongly linked to violence changes than was status; the status change predictor did not show as sizable effects.

It appears, therefore, that social disorganization and relative deprivation processes differentially underpin ecological change—violence change relationships. The latter process appears best suited to “explaining” increasing relative murder levels in emerging underclass neighborhoods. Social
disorganization, by contrast, appears to do a better job of "explaining" violence changes in gentrifying neighborhoods. Assault changes in underclass neighborhoods may be explained by either or both processes. Of course, our data patterns, at best, intimate the intervening social and social psychological processes; more clear-cut confirmation requires additional, micro-level investigation.

The nature of our findings warrants attention from policymakers. Our finding that declining status is associated with increasing disorder in neighborhoods becoming more clearly underclass is troubling. Wilson (1987) has already catalogued a host of ills bedeviling such communities, and the addition of increasing serious disorder to that list is not a welcome one.

But before policymakers can successfully intervene, assuming there is the political will and requisite "capital" to do so, the most fruitful points of intervention need to be identified. Sampson's (1987) recent city-level analyses highlighting family disruption and unemployment are extremely suggestive on this point. If such dynamics hold also at the subcommunity or neighborhood level, and the causal structure he identified also holds (increased disruption leads to increased violence, and not vice versa), such findings can be used to shape intervention or self-help strategies.

Policy attention is also warranted for the other rapidly changing clusters of neighborhoods identified here: gentrifying neighborhoods. Several "outlying but not deviant" neighborhoods in the scatterplots, although clearly not all of them, were in fact neighborhoods in which the city had intervened dramatically in the 1970's, selling "dollar houses" and making low-interest improvement loans to buyers willing to renovate and live in the units for a specified period of time. The neighborhoods that appeared to suffer the most from this strategy, in terms of increasing disorder, were those in close proximity to (a) high offender areas (i.e., public housing areas with the lowest employment and highest poverty rates; cf. Baldwin and Bottoms, 1976) and (b) the central downtown area. The latter condition results in high through-traffic of both pedestrians and vehicles.

Our findings for gentrifying neighborhoods may no longer be current if, since 1980, the locations have become more homogeneous and thus, perhaps, have developed into "defended neighborhoods." Nonetheless, in the future, policymakers intent on sponsoring similar rehabilitation ventures may wish to avoid neighborhoods with these locational features or consider ways to blunt the impacts of social disorganization (e.g., changing traffic patterns).

In sum, as a result of the historical context of the 1970's, the two most major changes experienced by urban neighborhoods were the further solidification of underclass neighborhoods and the appearance of gentrifying neighborhoods. Both of these changes reflect particular neighborhoods changing their roles in the larger urban mosaic. In Baltimore, both of these changes were associated with unexpected increases in relative violence levels. The
pattern of ecological change parameters with violence changes suggested that in underclass neighborhoods the violence was related to increased experience of relative deprivation, and that in gentrifying neighborhoods the violence was linked to increasing social disorganization. Confirmation of the responsible intervening processes awaits further investigation of the highlighted processes.

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