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A Dynamic View of Neighborhoods: The Reciprocal Relationship between Crime and Neighborhood Structural Characteristics

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Prior research frequently observes a positive cross-sectional relationship between various neighborhood structural characteristics and crime rates, and attributes the causal explanation entirely to these structural characteristics. We question this assumption theoretically, proposing a household-level model showing that neighborhood crime might also change these structural characteristics. We test these hypotheses using data on census tracts in 13 cities over a ten-year period, and our cross-lagged models generally find that, if anything, crime is the stronger causal force in these possible relationships. Neighborhoods with more crime tend to experience increasing levels of residential instability, more concentrated disadvantage, a diminishing retail environment, and more African Americans ten years later. Although we find that neighborhoods with more concentrated disadvantage experience increases in violent and property crime, there is no evidence that residential instability or the presence of African Americans increases crime rates ten years later. Keywords: neighborhoods, crime, longitudinal models, spatial effects, reciprocal effects.

Social scientists have long been concerned with the role of certain key structural characteristics in explaining the generation of crime in neighborhoods. Numerous studies have built on the insights of social disorganization theory from the Chicago School in positing that these structural characteristics affect the relations among residents, resulting in a higher rate of crime (Bellair 1997; Sampson and Groves 1989; Warner and Pierce 1993). It is notable that the vast majority of studies in this tradition have used cross-sectional data to test these posited relationships, ignoring the possible directionality of this relationship. However, insight from the neighborhood satisfaction literature showing the negative effect crime can have on such assessments, along with the residential mobility literature showing the effect of neighborhood satisfaction on household mobility outcomes, suggests that crime may play a role in changing neighborhood structural characteristics through its effect on the residential mobility outcomes of households. As a consequence, cross-sectional designs attempting to explain the “mechanisms” through which such structural characteristics affect neighborhood crime may be premature if the directionality of the causal relationship itself is unclear.

There is a growing awareness among scholars that if residential mobility outcomes are made in *response to* crime, then crime itself may play a role in how neighborhoods change (Bursik 1988; Felson 2002; Miethe and Meier 1994; Skogan 1990). A burgeoning literature suggests that some neighborhoods are locked in a cycle of disadvantage in which certain structural characteristics (concentrated disadvantage, residential instability, and racial/ethnic heterogeneity) and neighborhood crime and disorder reciprocally influence one another (Bursik 1988; Felson 2002; Miethe and Meier 1994; Skogan 1990). This possibly reciprocal relationship between key neighborhood structural characteristics and crime rates implies a

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vicious cycle for such neighborhoods, a cycle in which the residential mobility of the most disadvantaged residents may play a substantial role (Sampson and Sharkey 2008).

We suggest that to understand this dynamic neighborhood process requires a multilevel theoretical model that explicitly takes into account the actions of households, consistent with the recent call to theoretically integrate the interrelationship between crime and residential mobility (Liska and Bellair 1995:604; South and Messner 2000). We develop such a model here, and an important implication is that to the extent households adopt an exit strategy *in response to* the level of crime, this can help explain the existence of various structural characteristics of neighborhoods. For instance, if households choose to leave neighborhoods when the crime rate increases, the rate of residential instability will increase. If households of different racial/ethnic backgrounds have differential abilities to leave high crime areas, this will change the racial/ethnic composition of the neighborhood. And to the extent that households prefer areas with less crime, we show below how this can give rise to residential mobility outcomes that result in high crime areas containing a high number of households in poverty. In all three instances, it is the higher level of crime that *causes* these structural characteristics, rather than a causal relationship from these structural characteristics to crime as postulated by the social disorganization model.

Nonetheless, few empirical tests exist of these possible reciprocal effects at the neighborhood level. Although two studies tested for a reciprocal relationship between crime rates and residential mobility flows utilizing large cities and metropolitan areas as the units of analysis and found that higher levels of crime resulted in a greater concentration of nonwhite population (Liska and Bellair 1995; Liska, Logan, and Bellair 1998), using large cities as the unit of analysis is arguably too large to capture the more *meso* level of neighborhoods at which these processes work. Prior studies using neighborhood-level data focusing on the co-occurrence of neighborhood residential instability and crime do not explicitly attempt to tease out this causal process (Bursik and Webb 1982). One of the few studies to test the effect of crime on population loss and racial/ethnic change assumed no reverse effect on crime rates, and was constrained to studying such change within a single midwestern city (Morenoff and Sampson 1997). Likewise, few studies have tested whether crime also leads to a clustering of those living in concentrated disadvantage. Thus, few empirical tests of whether crime can play a role in changing neighborhood structural characteristics exist, or whether this role may in fact be even greater than the effect of these structural characteristics on neighborhood crime. Furthermore, by testing these processes on a sample of tracts in 13 cities our results are more generalizable than those from a single city.

This article takes the following course. We first briefly consider the explanation of social disorganization theory for why neighborhood structural characteristics will affect the level of crime in a neighborhood. We then discuss theoretical reasons why household mobility outcomes *in response to* levels of crime might lead to changes in neighborhood structural conditions. Following that, we describe our data and our analytical approach employing cross-lagged models that test the effect of neighborhood crime on these structural characteristics ten years later, and likewise the effect of these structural characteristics on crime ten years later. We close with a discussion and consider implications of the findings for theories of neighborhoods.

Theories of Neighborhood Structural Characteristics and Crime Rates

Neighborhood Structural Characteristics Cause More Crime

The social disorganization theory has a long history and was developed from the pioneering work of scholars in the Chicago School (Shaw and McKay 1942). This early work conceptualized the city as an ecology in which residents moved to more desirable neighborhoods, and as a consequence certain neighborhoods became characterized by a high level of

social disorganization and high levels of crime and delinquency. More recent work in this framework has focused on explicating the mechanisms through which certain neighborhood structural characteristics might lead to social disorganization (Sampson and Groves 1989). Specifically, Robert Sampson and Byron Groves (1989) emphasized that neighborhoods with more racial/ethnic heterogeneity, residential instability, and economic disadvantage had lower levels of formal and informal social control and therefore higher levels of both property and violent crime. Thus, the cohesion of residents enhances their willingness to confront possible deviants, and hence reduce the level of crime.

It is important to emphasize that the bulk of studies testing social disorganization theory, and variants of it, have employed cross-sectional tests. Thus, a common feature of nearly all these studies is assuming that crime does not affect these neighborhood structural characteristics. For instance, cross-sectional studies have found a positive relationship between residential instability and crime (Heitgerd and Robert J. Bursik 1987; McNulty 2001; Peterson, Krivo, and Harris 2000; Warner and Pierce 1993; Warner and Rountree 1997), racial/ethnic heterogeneity and crime (Hipp 2007; Roncek and Maier 1991; Sampson and Groves 1989; Warner and Rountree 1997), and poverty and crime (Hipp 2007; Warner and Pierce 1993; Warner and Rountree 1997). It is not clear how reasonable it is to simply assume that crime does not affect the residential mobility outcomes of households, or that it might not systematically affect the mobility outcomes of various types of households differently, thus leading to changes in the structural characteristics of the neighborhood. Even studies utilizing longitudinal data sometimes assume a unidirectional effect from these structural measures to change in crime over time (Kubrin and Herting 2003).

In addition to considering the independent effects of each of these structural characteristics, recent scholarship has argued that the meaning of residential stability differs based on the economic characteristics of the neighborhood (Warner and Pierce 1993; Warner and Rountree 1997). In this viewpoint, although residential stability in a more economically advantaged neighborhood likely translates into greater social cohesion due to the increased social interaction among residents, residential stability in economically disadvantaged neighborhoods may not translate into social cohesion. The reasoning behind this latter conjecture is that in disadvantaged neighborhoods, residents are often relatively trapped due to an economic inability to leave the neighborhood, and not because of a sense of attachment to the neighborhood. If residents in such neighborhoods do not socialize due to a general fear of neighborhood crime, this longer residence will not translate into greater social interaction and cohesion. There is some evidence for this hypothesis from studies using cross-sectional data (Warner and Pierce 1993; Warner and Rountree 1997), though we are aware of no longitudinal tests of this hypothesis.

An important question when testing social disorganization theory longitudinally is defining the appropriate time lag for modeling these processes. For instance, if a relatively stable neighborhood begins to undergo residential instability in which residents move out and are replaced, how long will it take for crime to begin to increase? There is no clear answer to this. This would certainly not occur immediately, as it would likely take a period of time for this instability to first break down the social ties among residents in the neighborhood, then lead to a diminished capacity to provide informal social control, and then for potential offenders to become aware of this and target the neighborhood more frequently. Given the slow pace of change in neighborhoods in general, it is likely that this may be a process that takes several years—perhaps even five to ten. For example, one study using cities as the unit of analysis found that the optimal lag length was 10 to 15 years for capturing the reciprocal relationship between violent crime and residential mobility (Liska and Bellair 1995). Studies using census tracts as the unit of analysis frequently posit and test models with ten year lags (Bursik 1986b; Bursik and Grasmick 1992; Bursik and Webb 1982; Morenoff and Sampson 1997; Schuerman and Kobrin 1986).

Beyond these structural characteristics of neighborhoods, another component of the social disorganization model posits that physical and social disorder will bring about higher levels of crime. Some scholars have suggested that social and physical disorder can actually play a causal

role in increasing crime (Kelling and Coles 1996; Wilson and Kelling 1982). Thus, according to the broken windows theory, neighborhoods with higher levels of incivilities (that is, physical or social disorder) send a signal to more serious offenders of an inability to proactively respond to more serious events. This implies that neighborhoods with more social and physical disorder will experience increasing levels of crime over time. Again, the time frame in which this process would occur is unclear, though it might be expected that it would occur relatively rapidly. That is, given that this theory posits that such disorder is a visual cue to potential offenders about the lack of guardians in such neighborhoods, we would expect that increasing levels of disorder would lead to more crime within a relatively short period of time that is likely well less than one year. This perspective is contrasted by that of scholars such as Sampson (1991) who suggested that both crime and disorder are produced from the same social process, and therefore any observed relationship is spurious. The empirical evidence regarding the crime/disorder relationship is hotly contested (Sampson and Raudenbush 1999; Sampson and Raudenbush 2004; Taylor 2001), though studies rarely test this with longitudinal data.

Crime Affecting Neighborhood Characteristics

Although Clifford Shaw and Henry McKay (1942) posited that residents choose to move to certain neighborhoods based on their economic resources, they did not explicitly consider whether higher rates of crime could induce greater residential mobility out of a neighborhood. We suggest that households desire neighborhoods with less crime. This implies a multilevel model in which neighborhood crime affects household mobility outcomes. If this is the case, and there are systematic differences in which households leave, then each of these structural characteristics of neighborhoods can be affected by neighborhood crime. We explore this in depth next.

We utilize a household-level model developed by William Lyons and David Lowery (1986) building on the insights of Albert Hirschman's (1970) notions of exit and voice, in which households can respond to neighborhood problems (such as crime and disorder) through four possible responses: (1) exit, (2) voice, (3) loyalty, or (4) neglect (Lyons and Lowery 1986; Orbell and Uno 1972). *Exit* is choosing to move out of a neighborhood experiencing problems to get away from these neighborhood problems, although there is no guarantee that the new neighborhood will indeed have fewer problems. *Voice* entails various responses that attempt to address the neighborhood's problems, and is embodied in the voluminous social disorganization literature discussing the provision of informal social control and collective efficacy by residents in neighborhoods (Sampson and Groves 1989; Sampson, Raudenbush, and Earls 1997). *Loyalty* implies remaining committed to the neighborhood with an abiding sense of the quality of the neighborhood: such individuals might be less likely to notice issues that other residents classify as "problems." We will not consider this option further in this study, although it has interesting implications for studies of resident perceptions. Finally, *neglect* would be a person noticing such problems but doing nothing about them.

Although this model simply enumerates the possible choices facing residents—leaving unanswered the important question of which residents are more likely to adopt the various choices—it is nonetheless useful in highlighting implicit assumptions in some prior research. That is, most research in the social disorganization tradition assumes that households are constrained to particular neighborhoods and that household responses to neighborhood problems are limited to either joining neighborhood associations and participating in activities designed to combat crime (voice), or simply shrinking from social life (neglect) (Gerson, Stueve, and Fischer 1977; Perkins et al. 1990; Skogan 1989; Taylor 1996). Thus, some scholars have suggested that residents can respond to perceived community problems through increased participation in neighborhood associations; again, voice instead of neglect (Crenshaw and St. John 1989; Oliver 1984; Swaroop and Morenoff 2006). Other studies have focused on a reciprocal relationship between neglect and voice: studies testing for a reciprocal relationship

between crime and informal social control (a mechanism of social disorganization) implicitly assume that individuals only respond to crime through the amount of informal social control they provide and not through residential mobility outcomes (Bellair 2000; Markowitz et al. 2001; Sampson and Raudenbush 1999).

Although studies focusing on the possible reciprocal relationship between crime and the voice behavior of residents provide important insights, we suggest here that exit is an important option that is rarely considered. The notion that crime is undesirable is hardly controversial. Studies in the neighborhood satisfaction literature have consistently found that residents who perceive more crime are less satisfied with the neighborhood (Adams 1992; Harris 2001; Hipp 2009; Parkes, Kearns, and Atkinson 2002), and those who express more fear of crime are less satisfied (Hartnagel 1979; Sampson 1991). The evidence that neighborhood satisfaction then translates into mobility suggests an indirect route through which crime can affect mobility (Deane 1990; Speare 1974; Speare, Kobrin, and Kingkade 1982). This suggests that crime can play a catalytic role in neighborhood change, either through motivating residents to respond to neighborhood crime through residential mobility (exit), or by motivating involvement in activities to improve the neighborhood (voice).

Note that this is a somewhat different focus than recent research studying the role of concentrated disadvantage in reproducing itself. That is, rather than focusing on the role of crime in affecting neighborhood change over time, a body of recent scholarship has studied the role of residential mobility in reproducing disadvantage. For example, Sampson and Patrick Sharkey (2008) showed that residents leaving disadvantaged neighborhoods often entered new neighborhoods equally disadvantaged. Likewise, a body of literature using the Panel Study of Income Dynamics study has consistently shown that poverty households are more likely to move into equally disadvantaged neighborhoods when they are able to leave a neighborhood (Quillian 1999; South and Crowder 1997a). Nonetheless, these studies showing that households with lower economic resources are less able to leave disadvantaged neighborhoods do not address whether crime is actually a key part of the causal process.

There is indeed some empirical evidence that crime induces mobility. For example, Wesley Skogan (1990) found that crime rates cause dissatisfaction and a desire to move in a study of 40 neighborhoods. Although Scott South and Glen Deane (1993) found no effect of *perceived* crime on mobility decisions, another study found a significant effect for *actual* crime events (Dugan 1999). A study of census tracts in Los Angeles found that tracts with higher levels of violent or property crime in one year experienced a higher volume of home sales the following year (Hipp, Tita, and Greenbaum 2009), and a study of Chicago neighborhoods found that higher levels of crime led to greater population loss over the following decade (Morenoff and Sampson 1997). Studies have also tested this possible relationship using cities as units of analysis (Cullen and Levitt 1999; Liska and Bellair 1995; Liska et al. 1998).

If crime plays a role in causing residential mobility, it is uncertain whether certain types of crime are more important. Turning to the literature on crime perceptions for insight, one perspective is that of Franklin Zimring (1997), who argues that violent crime is particularly important for creating fear and uncertainty in the United States. In support, the National Survey of Crime Severity found that residents rated violent crimes as much more serious than property crimes (Wolfgang et al. 1985). This implies that violent crime might have the strongest effect on residential mobility outcomes. On the other hand, Skogan and Michael Maxfield (1981) argued that whereas a specific violent event may be most salient for residents, the much greater frequency of property crime events makes them more salient overall for fostering a fear of crime. If this fear of crime leads to increased residential mobility, then this implies that it will be property crime rates that will have the strongest effect on residential mobility. Nonetheless, we have little evidence regarding these competing perspectives.

If households are choosing to leave a neighborhood in response to crime, one obvious consequence is that neighborhood residential instability will necessarily increase if numerous residents choose to move out of the neighborhood. This is simply a mathematical identity, as

scholars often measure residential instability based on the proportion of new residents in the last five years, or the average length of residence.

A key theoretical question is the length of the time period through which the process takes place. That is, if crime begins to increase, how long does it take for residents to (1) become aware that crime is increasing, and (2) decide what action to take in response to this change. We have little evidence addressing these questions. It is likely that each of these steps would occur over a nontrivial period of time: it would arguably take more than a few additional crime events for residents to detect a significant pattern of change. Given perceived attachment to the neighborhood, residents would likely be slow to detect that a qualitative change has occurred in the neighborhood. Furthermore, even after residents have determined that they wish to move, actual mobility can take a period of time. This occurs because the constraints of school attendance for children as well as job location for adults affect the ability to find a suitable alternative neighborhood (Bayoh, Irwin, and Haab 2006; Epple and Sieg 1999). Given the slowness with which neighborhoods change, a period of several years would be a likely minimal time lag for this entire process. Indeed, studies have viewed some of these processes over a ten-year period (Bursik 1986a, 1986b; Liska and Bellair 1995; Morenoff and Sampson 1997).

We point out that even if ten years is too long a lag, it may not cause any particular problems. The logic is as follows: for a lag period to be too long and cause estimation problems would require that the process took place and then was reversed during the lag period. However, given that neighborhoods tend to change in a linear direction—and do not oscillate rapidly in their demographic characteristics—it is unlikely that a neighborhood would increase in crime, causing residential instability to increase in the next few years, but then fall in crime and cause instability to decrease. Instead, even if the process occurred within, say, a five-year period, that a new equilibrium amount of crime would have been achieved and the process would remain stable for the next five years. In this case, a ten-year lag would still capture the effects, though with somewhat less precision than would a study specifying the lag more precisely.

Crime, Disadvantage, and Mobility

These considerations raise a puzzle: although it is clear why residents would prefer to flee a neighborhood with increasing levels of crime, it is less obvious why other residents would be willing to move *into* such a neighborhood. If potential residents are aware of increasing problems in a neighborhood, one explanation is based on relative economic resources.¹ That is, if all households prefer less crime, neighborhoods with the least amount of crime will be most desirable and hence have the highest rents and home values. This implies that at equilibrium, households with the most resources (high-income households) will reside in low crime neighborhoods; those with average levels of income will reside in neighborhoods with average levels of crime; and low-income households will reside in high crime neighborhoods. This implies an inverse relationship between the economic resources and the level of crime in a neighborhood. Although a low-income household would prefer to live in a neighborhood with less crime, this would require displacing a higher income household who would then end up in the high crime neighborhood. The household with more resources is likely willing and able to pay more to live in the neighborhood with less crime, and would not be willing to move to a higher crime neighborhood without other compensating features.

1. Another possible explanation stems from information asymmetry, as residents leaving a neighborhood are likely more intimately aware of the actual level of crime and disorder than potential new residents. That is, someone viewing a neighborhood for the first time may be less aware of the actual level of crime, particularly if the neighborhood is undergoing recent change. In support, there is evidence that households who have lived longer in the neighborhood perceive more crime (Hipp forthcoming; Sampson et al. 1997) and more risk of crime (Taylor, Gottfredson, and Brower 1984). Another study found that residents who lived longer in the neighborhood expressed more fear of walking in their local block at night and more fear of walking in the broader neighborhood both during the day *and* night (Taylor 2001).

If the rate of crime increases, the current residents will prefer to move out, but prospective residents will be less willing to move in if they are aware of the higher rate of crime. This would induce downward pressure on home values and rents, causing lower income households to move into a neighborhood. An important implication of this is that increasing neighborhood crime will bring about a structural change as those with lower levels of income move into the neighborhood. Indeed, studies have shown that neighborhoods with higher rates of crime have lower home values (e.g., Buck and Hakim 1989; Schwartz, Susin, and Voicu 2003; Thaler 1978), and that neighborhoods experiencing increasing levels of crime will undergo falling relative home values (Hipp et al. 2009; Tita, Petras, and Greenbaum 2006). A study of New York City suggested that the large increase in home values could in part be attributed to the simultaneous drop in the city's crime rate (Schwartz et al. 2003). There is therefore suggestive evidence that crime can be a catalyst for a downward trajectory in a neighborhood through increasing out-mobility and falling home values.

Although crime will make a neighborhood less desirable and reduce home values, it is also possible in extreme instances that residents abandoning a neighborhood may be unable to find purchasers for their homes, and simply move away. This can occur if newer developments on the fringe of an urban area create new openings in the housing market, or if households simply choose to abandon the metropolitan area. Similarly, landlords may not be able to find replacement tenants for renters abandoning the neighborhood, increasing the rate of vacancies in rental housing. A consequence is that the neighborhood would experience a population decrease. The well-documented general pattern of booming suburbs along with a shrinking urban core suggests exactly this process (Alba, Logan, and Bellair 1994; Alba et al. 1999; Kasarda et al. 1997; South and Crowder 1997b). Likewise, Sampson and John Wooldredge (1986) found that crime induced mobility away from central cities, and Julie Berry Cullen and Steven Levitt (1999) found that cities with more crime experienced a decreasing population over time. Jeffrey Morenoff and Sampson (1997) found that census tracts in Chicago with high numbers of homicides led to general population losses.

Another consequence of this higher rate of crime is the possible effect it might have on the economic vibrancy of the neighborhood retail environment. In part, this can occur if the level of crime changes the economic composition of the neighborhood. That is, if residents with fewer economic resources are moving into a neighborhood, their limited buying power will likely impact the sales vitality of the retail district. The presence of crime may also directly reduce economic vitality if residents from both the neighborhood and nearby neighborhoods avoid shopping at local stores.²

Crime, Race/Ethnicity, and Mobility

Although a household's economic resources affect the neighborhoods they can enter, certain racial/ethnic minorities may also face particular mobility constraints. Specifically, African Americans likely face mobility constraints (Cutler, Glaeser, and Vigdor 1999; Kain and Quigley 1975; Rosenbaum 1994; South and Crowder 1997a; South and Deane 1993).³ This can occur simply due to preferences if most African Americans are unwilling to move into a neighborhood

2. It is also possible that this is a reciprocal relationship between retail shops and crime, as retail shops may increase the presence of potential targets and hence crime. This follows from the routine activities theory, and cross-sectional studies have suggested such an effect (Ouimet 2000; Smith, Frazee, and Davison 2000). These cross-sectional models cannot determine the direction of causality.

3. Another possibility is that households simply prefer to live in areas that are ethnically homogeneous. However, such a simple selection model would not affect the model proposed here: An area with an average amount of crime and households of an average income level of one racial/ethnic group would simply transform into a similar such neighborhood composed of households of another racial/ethnic group. There is no reason to then expect an increase in the level of crime in the neighborhood. Thus, while Schelling-type (1978) tipping models are useful for explaining the ethnic transformation of a neighborhood, they have no implications for the model developed here. Instead, our model only assumes systematic restriction of access to neighborhoods for a particular racial/ethnic group.

dominated by all whites (Farley et al. 1994). Alternatively, gatekeepers can have strong effects, as considerable evidence suggests that real estate agents can steer potential tenants towards particular neighborhoods (La Gory and Pipkin 1981). There is consistent evidence from audit studies of discrimination towards racial/ethnic minorities in the housing market (Turner et al. 2000). Similarly, a phone audit study found that speaking in a black English vernacular reduced the chances of being directed to particular rental units (Fischer and Massey 2004).

There is evidence that the limited mobility options of African Americans trap them in undesirable neighborhoods. A study using the Panel Study of Income Dynamics (PSID) found that among those who moved out of a poor neighborhood, African Americans were less likely to move into a nonpoor tract, even controlling for income levels (South and Crowder 1997a). A study of residential mobility in Chicago found that residents from disadvantaged neighborhoods who moved often ended up in neighborhoods that were similarly disadvantaged, and this effect was strongest for African Americans (Sampson and Sharkey 2008). These findings are consonant with the locational attainment literature that has consistently shown that racial/ethnic minorities move into more economically disadvantaged neighborhoods, even controlling for their own level of economic resources (Alba and Logan 1992; Logan, Alba, and Leung 1996). Likewise, the greater tendency for racial/ethnic minorities to enter neighborhoods dominated by members of their same race/ethnicity is also firmly established (Logan et al. 1996; Massey and Mullan 1984; Rosenbaum 1994; Rosenbaum and Argeros 2005; South and Crowder 1997b).

If minority residents are indeed systematically denied access to neighborhoods, this has important implications for the model we are considering here. Specifically, this implies that whereas all residents prefer avoiding neighborhoods with higher levels of crime, racial/ethnic minorities may have less ability to avoid such neighborhoods. Consider the implications for a neighborhood occupied entirely by white households: with a rise in the crime rate, we have suggested above that lower-income households would replace households that left the neighborhood, transforming this into a low-income, high crime neighborhood. However, an alternative possibility is that middle-income *minority* households who lack access to other neighborhoods will replace these households, transforming this into a middle-income, minority, high crime neighborhood. Again, we would expect this process to occur over a period of several years, likely five to ten years.

The evidence for this racial/ethnic transition of neighborhoods due to crime is mixed. For example, two recent studies using longitudinal city-level data found that higher levels of crime resulted in a greater concentration of nonwhite population (Liska and Bellair 1995; Liska et al. 1998). Of course, cities may be too crude a geographic level to test these processes that occur at the level of local neighborhoods. One longitudinal study of neighborhoods in Chicago found that the delinquency rate in 1960 increased the number of nonwhites in 1970, though this study included few control variables and did not test a reciprocal model (Bursik 1986a). A study of Chicago found that although tracts with more homicides had a lower proportion of black residents ten years later, the change in the number of homicides in nearby tracts increased the proportion black ten years later (Morenoff and Sampson 1997). In contrast, increasing levels of homicide in the tract and nearby tracts reduced the proportion white ten years later in this same study. On the other hand, a study using individual-level data from the PSID found that the ratio of crime in central cities to suburbs actually resulted in African Americans being *more* likely than whites to move to the suburbs (South and Crowder 1997b). Thus, the evidence regarding this question is somewhat mixed.

Summary

Our discussion implies that in addition to the effect that neighborhood structural characteristics might have on crime, crime may well affect these structural characteristics. We test this here with our tract-level data measured at two points in time. We describe the data and our modeling strategy in the next section.

Data and Methods

Data

This study utilized crime data for 2,534 census tracts in 13 cities in the years 1990 and 2000.⁴ These cities were not selected randomly, but rather are a convenience sample of cities with available crime data at these two time points. Therefore, the study does not generalize to the population of cities, but rather simply focuses on the differences over time in tracts within particular cities by conditioning out the differences across cities, as described in the methods section. An advantage of using census tracts is that past studies have frequently used them to proxy for neighborhoods, they contained a mean of about 4,300 residents in 2000 (with 95 percent of the tracts containing between about 1,400 and 8,000 persons), and they were initially constructed by the Census Bureau to be relatively homogeneous neighborhoods (Green and Truesdell 1937; Lander 1954).⁵ However, some of the crime data are aggregated to other geographic units, such as “neighborhoods,” necessitating recollapsing these data to census tracts. Homogeneity across physical areas was assumed when apportioning these data to census tracts.⁶

Dependent Variables

The dependent variables in the analyses are based on the crime reports officially coded and reported by the police departments in the cities of the study, aggregated to census tracts. We estimated models using violent crime as one outcome (combining aggravated assault, murder, and robbery) and property crime as the other outcome (combining burglary, larceny, and motor vehicle theft). Each of these crime measures were calculated as the number of crime events that occurred per 100,000 population and natural log transformed to reduce

4. The cities included in the study (with number of census tracts in parentheses) were Baltimore (202), Berkeley (29), Cleveland (225), Denver (187), Indianapolis (146), Los Angeles (713), Milwaukee (235), Pittsburgh (175), Rochester, NY (90), Sacramento (187), Salinas (27), Seattle (126), and Washington, DC (192). There are 2,342 tracts in the property crime models, given that we did not have property crime information for Washington, DC tracts.

5. Since the majority of the tracts contained crime data in 1990 tract boundaries (rather than 2000 tract boundaries), all of the data were placed into 1990 tract boundaries. To calculate the value of a count variable in 2000, we sum the values of the tracts in 1990 by the proportion of the tract in the full tract in 1990:

$$X_i = \sum_{j=1}^J X_j (P_j / P_{ji})$$

where X_i represents the count of the variable of interest in 2000 in the 1990 tract boundaries that we are estimating of the i -th tract at time one, X_j represents the count of the variable of interest in the $j = 1$ to J tracts in 2000 lying within the 1990 boundary, P_j represents the population of the 2000 tract j , and P_{ji} represents the population of tract j contained within tract i in 1990. Thus, we are weighting by the proportion of the 2000 tract lying within the 1990 tract. For per capita variables:

$$X_i = \frac{1}{J} \sum_{j=1}^J X_j (P_j / P_{ji})$$

where X_i represents the per capita value of the variable of interest in 2000 in the 1990 tract boundaries that we are estimating of the i -th tract in 1990, X_j represents the per capita value of the variable of interest in the $j = 1$ to J tracts in 2000 lying within the 1990 boundary, P_j represents the population of the 2000 tract j , P_{ji} represents the population of tract j in the 1990 (i) boundaries, and we now are taking the mean value of the per capita variable (since we are dividing by J).

6. To place a per capita measure into common units, we take into account the proportion of the tract's population contained within each neighborhood:

$$X_i = \frac{1}{J} \sum_{j=1}^J X_j (P_{ji} / P_i)$$

where X_i represents the per capita measure of the variable of interest in the tract that we are estimating, X_j represents the per capita measure of the variable of interest in the $j = 1$ to J neighborhoods the tract overlaps, P_{ji} represents the population of neighborhood j contained within tract i , and P_i represents the population of tract i .

skew and minimize the possibility of outliers. We averaged these measures over three years to minimize yearly fluctuations: these were generally 1990 through 1992 for the first time point and 1999 through 2001 for the second time point.⁷

Neighborhood Structural Characteristics

Several key neighborhood characteristics are employed. We created measures for 1990 to predict crime in 2000, and measures for 2000 that are predicted by 1990 crime. This follows the theoretical discussion above that focuses on the generation of these neighborhood structural characteristics. Most of these data come from the U.S. Census for 1990 and 2000.

We included measures of the racial/ethnic composition and heterogeneity of the tract. To capture effects of racial composition we included the percent African American and the percent Latino. To capture racial/ethnic heterogeneity, a Herfindahl index (Gibbs and Martin 1962:670) was constructed of five racial/ethnic groupings (the groups are white, African American, Latino, Asian, and other races), which takes the following form:

$$H = 1 - \sum_{j=1}^J G_j^2 \quad (1)$$

where G represents the proportion of the population of racial/ethnic group j out of J groups.

Following prior research, we measure the economic environment of the neighborhood by creating a measure of *concentrated disadvantage*. We created this scale by combining in a principal components analysis four variables commonly used when measuring concentrated disadvantage and creating a factor score: average family income, percent of the population at or below 125 percent of the poverty rate, percent divorced, and percent unemployed.⁸ Positive values indicate more disadvantaged neighborhoods. We measured *residential instability* by creating an index (based on a principal components analysis) that combines the percentage of tract households who own their residence, the percentage of households in the same unit five years previously, and the average length of residence in the tract.⁹ We multiplied this by -1 to make this a measure of *instability*.

We included a measure of the percentage of residential units that are occupied, given that abandoned buildings may increase crime opportunities (Krivo and Peterson 1996; Roncek 1981;

7. The exceptions to this were that for Baltimore we averaged over 1989–91 for the first time point and 2000–02 as the second time point. For Seattle we averaged over 1989–91 as the first time point; for Rochester and Sacramento the years were 1991–93; for Los Angeles they were 1992–94; for Milwaukee they were 1993–95. For Indianapolis, the years were 1992–94 and 1998–2000. For Washington, DC they were 1988 and 1990, and 1998–2000.

8. Although principal components analysis is an exploratory approach, we only used variables that prior research has consistently shown capture this construct rather than including a large number of measures in the principal components analysis in an atheoretical strategy. These four variables had a Cronbach's alpha of .85. The largest Eigenvalue for this factor was 2.94 and explained 74 percent of the variance, and the loadings were $-.74$ for average household income, $.92$ for percent at or below 125 percent of poverty, $.89$ for percent divorced, and $.86$ for percent unemployed. The uniquenesses for these measures were $.45$, $.15$, $.20$, and $.25$, respectively. The factor scores were created using regression scoring, but rather than fully standardizing these variables when combining them based on the factor scores (with a mean of 0 and a standard deviation of 1), we standardized the variance for each variable (equal to 1), but maintained the mean of these variables. This strategy allows for mean differences in this measure over time. Although some scholars include a measure of percent African Americans in a concentrated disadvantage scale, we do not as we argue that this is *conceptually distinct* from disadvantage. That is, African Americans may live in disadvantage, but skin color is not an inherent *measure* of disadvantage. This strategy also allows us to test the effect of crime rates on neighborhood racial/ethnic composition over time. Furthermore, adding percent African American to our principal components analysis showed it to have a much higher uniqueness than the other indicators except average household income.

9. Again, we only included these specific variables in the principal components analysis. The Cronbach's alpha for these variables was $.78$. The largest Eigenvalue was 2.4 and explained 80 percent of the variance, and the factor loadings were $.82$ for percent owners, $.95$ for average length of residence, and $.91$ for percent living in the same house five years previously. The uniquenesses for these same measures were $.33$, $.11$, and $.16$, respectively.

Table 1 • Summary Statistics of Variables Used in Analyses

	2000		1990	
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Violent crime rate per 100,000 persons	6.49	1.65	6.78	1.74
Property crime rate per 100,000 persons	8.12	1.54	8.46	1.61
Percent occupied units	91.79	8.05	91.86	7.54
Percent African American	29.06	34.17	27.96	35.05
Percent Latino	19.32	24.80	15.18	22.18
Racial/ethnic heterogeneity	39.75	20.15	33.09	20.31
Retail employees per capita	5.90	.85	6.41	.87
Bars and liquor store employees per capita	4.24	1.77	4.45	1.64
Residential instability factor	-3.27	.99	-3.31	1.04
Concentrated disadvantage factor	1.20	1.07	1.13	1.17

Note: Sample sizes of outcomes: violent crime = 2,534; property crime = 2,342

Roncek and Maier 1991). Note that as a predictor in the models with crime as an outcome, this can serve as a proxy for physical disorder; as an outcome variable it serves as a proxy for population loss since the residents in these units left but were not replaced. As a proxy for social disorder, we computed the number of employees of bars and liquor stores per 10,000 population who work in the tract.¹⁰ Alcohol outlets are clearly a crude proxy for social disorder; unfortunately, our data did not contain any more appropriate measures. Although a literature of cross-sectional studies suggests that alcohol outlets will be crime attractors (Gorman et al. 2001; Lipton and Gruenewald 2002; Nielsen and Martinez 2003), we are able to test this process in a longitudinal framework. To capture retail vibrancy we computed a measure of the number of retail employees per 10,000 population who work in the tract. These latter two measures come from the 1987 and 1997 economic censuses, and this zip code aggregated data is apportioned into their constituent census tracts based on the proportion of the zip code population contained within a given tract. Finally, we accounted for possible nonlinear effects by also computing polynomials of all of our measures and testing for significant effects: significant polynomials remain in the presented models to capture nonlinearity. The summary statistics for the variables used in the analyses are presented in Table 1.

Methodology

Given that we are attempting to disentangle the causal direction between neighborhood levels of crime and structural characteristics, we used a cross-lagged model. Thus, in this model we are testing for a simple form of Granger causality in determining whether neighborhood structural characteristics lead to a change in crime over the following decade, or whether neighborhood crime leads to a change in structural characteristics over the following decade. We focus on the change in these characteristics over a ten-year period given our prior discussion of the appropriate lag suggesting that shorter time lags might be too short. Data constraints also limit us to ten-year lags. Our full model includes equations for the outcome of crime and all the neighborhood characteristic outcomes. Thus, we estimated 12 equations simultaneously in a single model, and these models were estimated as structural equation

10. We used the number of employees rather than the number of establishments since this measure likely provides a more accurate depiction of the impact of such businesses on the neighborhood. Thus, the presence of these establishments is not posited to increase crime, but rather the number of people they attract (both patrons, and possible perpetrators). Since establishments with more patrons will generally have a greater number of employees, the number of employees better captures this notion than a simple count of the number of establishments.

models in Mplus 4.1.¹¹ We show two of the equations for such a model (the others generalize from these):

$$Y_{1(t+1)} = \beta_1 Y_{1t} + \beta_2 Y_{2t} + \Gamma_1 X_t + \Omega_1 C + \zeta_1 \quad (1)$$

$$Y_{2(t+1)} = \beta_3 Y_{1t} + \beta_4 Y_{2t} + \Gamma_2 X_t + \Omega_2 C + \zeta_2 \quad (2)$$

where in equation 1 the outcome $Y_{1(t+1)}$ is crime in the tract of interest at the next time point, Y_{1t} is crime in the tract at the current time point, which has a β_1 effect on crime ten years later (an autoregressive parameter), Y_{2t} is a particular neighborhood structural characteristic (such as concentrated disadvantage) that has a β_2 effect on the crime rate, X_t is a matrix of the other neighborhood structural characteristics measured at the beginning of the decade and Γ_1 is a vector of parameters showing the effects of these structural characteristics on neighborhood crime, C is a matrix of $J-1$ indicator variables for J cities in the sample and Ω_1 is a vector of their effects on the crime rate, and ζ_1 is a disturbance term.¹² Since there are only 13 cities and they are not randomly sampled, we do not estimate a multilevel model but instead account for this clustering with indicator variables for the cities. Thus, we are estimating a fixed effects model conditioning on cities. In equation 2, all terms are defined as before, and $Y_{2(t+1)}$ represents the neighborhood structural characteristic at the end of the decade. Thus, in these equations β_2 and β_4 are the parameters of interest, as they show whether crime affects this neighborhood structural characteristic, or whether this structural factor changes the level of crime.

Given that these tracts are located in physical space, we need to take into account possible spatial effects. It is important to consider how the spatial process might work. We suggest a reasonable model is one in which the outcome of interest is not only affected by the level of that measure in the same tract at the previous time point, but is also affected by the level of that measure in the surrounding tracts at the previous time point. We also test whether the spatially lagged, time-lagged structural characteristics have important effects. For instance, in the equation predicting concentrated disadvantage we test whether the amount of concentrated disadvantage in a tract at the current time point is affected by the following measures at the previous time point: the amount of concentrated disadvantage in that same tract, the amount of concentrated disadvantage in the surrounding tracts, the presence of crime in the tract, and the presence of crime in the surrounding tracts.

The decision of which tracts are physically “close” is important for spatial analyses, and we posit a spatial process based on a distance decay function with a cutoff at two miles (beyond which the neighborhoods have a value of zero in the W matrix). This is plausible given prior studies suggesting a distance decay function for offenders (Rengert, Piquero, and Jones 1999) with an average distance traveled between 1 to 2.5 miles (Pyle 1974), and that the median census tract in 2000 was about 1.4 miles across (1.95 square miles). This resulting weight matrix (W) was then row-standardized.

Given a spatial lag effect, equations 1 and 2 are modified such that:

$$Y_{1(t+1)} = \rho_1 WY_1 + \rho_2 WY_2 + \beta_1 Y_{1t} + \beta_2 Y_{2t} + \Gamma_1 X + \Omega_1 C + \zeta_1 \quad (3)$$

$$Y_{2(t+1)} = \rho_3 WY_1 + \rho_4 WY_2 + \beta_3 Y_{2t} + \beta_4 Y_{1t} + \Gamma_2 X + \Omega_2 C + \zeta_2 \quad (4)$$

11. Given that we are estimating the models as structural equation models, we can assess the overall model fit. For all models it was quite excellent. For example, the violent crime model reported in Tables 2 and 3 had a Comparative Fit Index of .99, a Tucker Lewis Index of .95, and an RMSEA of .056, all suggesting a very good fit (Hu and Bentler 1999). The comparable values for the property crime model were .99, .95, and .054.

12. Note that if we were to substitute the change in the construct over time ($Y_{1(t+1)} - Y_{1t}$) as the outcome rather than the level of the construct at time 2 ($Y_{1(t+1)}$), the coefficient results would be identical with the exception of the coefficient of the time one measure of the outcome variable. This is discussed at length in Allison (1990). Therefore, we can either describe the outcome as the level of the measure at time two (controlling for the measure at time one) or as the change in the outcome over the decade (controlling for the measure at time one).

where all terms are defined as before, W is the chosen spatial contiguity matrix, WY_1 represents the spatially lagged outcome variable that has ρ_1 effect on the outcome (the spatial autoregressive parameter), WY_2 represents the spatially lagged cross-lagged measure that has ρ_2 effect on the outcome. Equation 4 represents the outcome of a structural characteristic such as concentrated disadvantage when including the spatially lagged terms. Because of the time-lagged nature of these equations, there are no identification issues as these are recursive models (Bollen 1989).

We adopted the following modeling strategy. We first estimated cross-lagged models for all outcomes (i.e., equations 1 and 2 as no spatially lagged measures were included). We then estimated a model including the time-lagged, spatial lags for all our variables. From this second model, we specified our final model by only including the spatial lags that were significant in this full model. There was no evidence of multicollinearity problems as all variance inflation factors in our final model were below 4.

Results

Crime and Economic Resources Reciprocal Effects

Although we estimated our two full models with all equations simultaneously (one model for violent crime and one for property crime), in our presentation we sequentially focus on the reciprocal relations between a particular dimension and crime to emphasize the relative time-lagged effect of each of these measures in this dynamic model. We present the equations with crime as an outcome in Table 2 and the equations with the other measures as outcomes in Table 3 (though these equations were all estimated simultaneously in a single model). Whereas Tables 2 and 3 present the results for the parameters of interest, the full model results are presented in the Appendix for violent crime in Table A1 and property crime in Table A2.

We point out that in the models in Table 2 crime exhibits the expected stasis effect: tracts with more violent crime in 1990 have more violent crime in 2000 (model 1). Likewise, tracts with more property crime in 1990 also have more property crime in 2000 (model 2). Furthermore, we see in each of these equations that the amount of crime in nearby tracts also increases the amount of property or violent crime in the focal tract ten years later—notably, this effect is about 70 percent stronger for violent crime than for property crime suggesting much stronger spatial autocorrelation for violent crime. Thus, we are controlling for these spatially lagged effects when interpreting our results.

We begin by viewing the relationship between a neighborhood's concentrated disadvantage and the change in crime, and we observe a reciprocal relationship. Neighborhoods with higher levels of concentrated disadvantage in 1990 experience higher levels of violent crime (equation 1 in Table 2) and property crime (equation 2 in Table 2) ten years later. Note, however, that this effect weakens for tracts with higher levels of concentrated disadvantage as indicated by the negative coefficient for the quadratic measure of concentrated disadvantage. A one standard deviation increase in concentrated disadvantage in 1990 from the mean increases the rate of violent crime .10 standard deviations ($\beta = .10$) and the rate of property crime .04 standard deviations ($\beta = .04$) ten years later. It therefore appears that neighborhoods with fewer economic resources are less able to fend off increases in violent or property crime over time.

In these same models, we see that neighborhoods with more violent crime at one time point experience a larger increase in concentrated disadvantage ten years later (see equation 1a in Table 3). This effect is particularly strong for the neighborhoods with the highest level of violent crime (as visually depicted in Figure 1). Increasing the level of violent crime from one standard deviation below the mean to the mean increases concentrated disadvantage .057 standard deviations, whereas an increase from the mean to one standard deviation above the mean increases concentrated disadvantage .086 standard deviations. This is consistent with the hypothesis above that low-income residents have the least ability to avoid such undesirable neighborhoods. It appears that it is only violent crime that brings about this

Table 2 • Cross-Lagged Models for Violent and Property Crime. Equations with Violent and Property Crime in 2000 Predicted by Tract Structural Characteristics in 1990

	<i>Violent Crime</i>	<i>Property Crime</i>
Crime rate	.777** (.013)	.875** (.011)
Crime rate spatially lagged	.099** (.019)	.060** (.016)
Concentrated disadvantage	.219** (.032)	.087** (.025)
Concentrated disadvantage squared	-.024** (.006)	-.011* (.005)
African American	-.308** (.068)	-.201** (.050)
Latino	.123 (.099)	.122† (.074)
Ethnic heterogeneity	.140† (.080)	-.042 (.061)
Residential instability factor	-.053** (.019)	-.020 (.014)
Residential instability factor spatially lagged	-.129** (.021)	-.048** (.017)
Occupied units	-.319 (.215)	-1.877** (.706)
Occupied units squared		1.121* (.469)
Bars/liquor stores per capita	.041** (.012)	.030** (.009)
Retail establishments per capita	.064* (.027)	.061** (.021)
Retail establishments per capita spatially lagged	-.116** (.037)	-.207** (.030)
R-square	.888	.942
N	2,534	2,342

Notes: Standard errors in parentheses. Violent crime equation is estimated simultaneously with equations 1a through 8a in Table 3. Property crime equation is estimated simultaneously with equations 1b through 8b in Table 3.

* $p < .05$ ** $p < .01$ † $p < .10$ (two-tailed tests)

process, as higher levels of property crime in 1990 do not significantly affect the level of concentrated disadvantage ten years later (equation 1b in Table 3).

Crime and Racial/Ethnic Composition Reciprocal Effects

Turning to the relationship between racial/ethnic composition and crime, we see surprisingly weak results for both causal directions of this relationship. There is no evidence in either of these models that higher proportions of African Americans in the tract lead to more violent or property crime ten years later. In fact, tracts with relatively more African Americans at the beginning of the decade actually saw a greater *decrease* in the amount of both violent and property crime ten years later. There were also minimal effects for the relative presence of Latinos or racial/ethnic heterogeneity on violent and property crime rates ten years later.

On the other hand, we do see evidence that neighborhoods with more violent crime experience an increase in the percentage African American (equation 2a in Table 3) ten years later,

Table 3 • Cross-Lagged Models for Violent and Property Crime. Equations with Neighborhood Structural Characteristics in 2000 Predicted by Crime and Other Characteristics in 1990

	(1a) Concentrated Disadvantage	(2a) African American	(3a) Latino	(4a) Ethnic Heterogeneity	(5a) Residential Instability	(6a) Occupied Units	(7a) Bars & Liquor Stores	(8a) Retail Employees
<i>Violent crime model</i>								
Violent crime	-.030 (.021)	.004* (.001)	.000 (.001)	.002 (.002)	-.075** (.020)	.023** (.003)	-.131** (.042)	-.019** (.005)
Violent crime squared	.006** (.002)				.013** (.002)	-.003** (.000)	.019** (.004)	
<i>Property crime model</i>								
Property crime	.007 (.007)	.000 (.001)	-.002* (.001)	.000 (.002)	-.085** (.020)	.023** (.003)	-.102* (.041)	-.027** (.005)
Property crime squared					.011** (.002)	-.002** (.000)	.012** (.003)	

Notes: Standard errors in parentheses. $N = 2,534$ in violent crime model, $N = 2,342$ in property crime model. Equations 1a through 8a are estimated in the violent crime model (along with the violent crime equation in Table 2); equations 1b through 8b are estimated in the property crime model (along with the property crime equation in Table 2). All equations include all structural measures as predictors (concentrated disadvantage proportion African American, proportion Latino, racial/ethnic heterogeneity, residential instability, proportion occupied units, bar and liquor store employees, retail employees), along with outcome measure at previous time point and spatially lagged version of outcome variable at previous time point.

* $p < .05$ ** $p < .01$ † $p < .10$ (two-tailed tests)

Figure 1 • Marginal Effect of Violent Crime Rate on Concentrated Disadvantage Ten Years Later

consistent with our hypothesis of differential mobility. Furthermore, although it appears that violent crime does not significantly affect racial/ethnic heterogeneity ten years later (equation 4a), an ancillary model not including the spatial lag of racial/ethnic heterogeneity found that neighborhoods with more violent crime had higher levels of racial/ethnic heterogeneity ten years later (results not shown). We emphasize that these effects were only observed for violent crime, as property crime did not increase the number of racial/ethnic minorities or racial/ethnic heterogeneity ten years later.

Crime and Residential Instability Reciprocal Effects

An important component of the social disorganization model is the hypothesized effect of residential instability on crime rates. Our models strongly refute this hypothesis and show much stronger evidence that crime in fact induces residential instability. In contrast to the predictions of social disorganization theory, in models not including the spatial lag of residential instability we found that neighborhoods with more residential instability at the beginning of the decade experienced a *decrease* in violent and property crime over the subsequent decade (results not shown). The model presented in Table 2 includes the spatial lags, and illustrates that it is the level of residential instability in the *nearby* tracts that is particularly important for decreasing crime. The effects are relatively strong in the equations predicting violent and property crime (Table 2), as more residential instability in nearby tracts decreases property crime ($\beta = -.034$) and violent crime ($\beta = -.075$) beyond the negative effect of instability in the focal tract ($\beta = -.023$).

Furthermore, we see in Table 3 that higher levels of both violent and property crime increase residential instability by the end of the decade. These are strong nonlinear effects, and graphing the effect of violent crime rates on residential instability ten years later (see Figure 2) shows a strengthening effect at the highest rates of violent crime. The effect of property crime on residential stability is similar, though somewhat weaker. As further evidence that crime induces mobility, neighborhoods with more violent or property crime at the beginning of the decade had more vacant units ten years later. This is again a particularly strong effect in neighborhoods with the highest rates of violent or property crime, as the shape of this relationship is similar to that in Figure 2. These effects were even stronger in a model not including the spatial lag of occupied units, suggesting that whereas crime can impact vacancy rates, these increased vacancies can affect vacancy rates in nearby tracts as well.

Figure 2 • Marginal Effect of Violent Crime Rate on Residential Instability Ten Years Later

Crime and Social Disorder Reciprocal Effects

We see mixed results for our measures of social and physical disorder. On the one hand, there is no evidence in models 1 and 2 in Table 2 that the presence of vacant units (a proxy for physical disorder) leads to more violent or property crime ten years later—in fact, tracts with higher rates of occupied units actually have somewhat higher rates of property crime ten years later. There is some evidence, however, that the presence of more bar and liquor store employees—our proxy for social disorder—leads to more violent ($\beta = .04$) and property ($\beta = .025$) crime over the following decade. This is consistent with the hypotheses of the social disorganization model. Nonetheless we emphasize that it also appears that crime increases this social disorder: the presence of more violent or property crime at the beginning of the decade leads to more bar and liquor store employees at the end of the decade, and this effect is particularly strong in the neighborhoods with the highest rates of crime. The shape of the quadratic is similar to that displayed in Figure 1 for concentrated disadvantage. The effect for property crime is similar, though weaker.

The pattern for retail stores is nuanced. On the one hand, retail stores appear to respond to the presence of crime as tracts with higher levels of violent ($\beta = -.037$) or property crime ($\beta = -.064$) have fewer retail employees ten years later. On the other hand, the effect of retail stores on crime is the only one we tested that showed an opposite effect for the spatially lagged measure. Whereas the presence of more retail store employees in the tract results in more violent and property crime ten years later—consistent with an opportunity explanation of such retail establishments—the presence of more retail store employees in nearby tracts actually had a negative effect on crime in the focal tract. This is consistent with a model in which such retail activity in nearby tracts provides opportunities for crime that siphon off events that would otherwise occur in the focal tract.¹³

13. The fixed effects for the cities were jointly significant in all of the equations. These capture differences across cities after taking into account these tract-level characteristics. In this sample, Baltimore, Indianapolis, Milwaukee, and Washington, DC had the largest positive coefficients for the violent crime equation, whereas Baltimore, Cleveland, Seattle, and Indianapolis had the largest positive coefficients for the property crime equation. Pittsburgh, Rochester, Seattle, and Denver had the smallest coefficients for the violent crime equation, whereas Pittsburgh, Rochester, and Los Angeles had the smallest coefficients for the property crime equation.

Figure 3 • Effect of Residential Instability, Moderated by Concentrated Disadvantage, on Violent Crime Ten Years Later

Interaction of Instability and Concentrated Disadvantage

Finally, given the evidence that concentrated disadvantage leads to more crime ten years later, we considered the additional hypothesis that it is stable neighborhoods with high levels of concentrated disadvantage that are more likely to see crime increases, as hypothesized by Barbara Warner and colleagues (Warner and Pierce 1993; Warner and Rountree 1997). We tested this hypothesis by creating interactions of neighborhood concentrated disadvantage and neighborhood residential instability and estimating additional models. In models without the spatially lagged version of residential instability, we found that although greater residential instability leads to less violent crime ten years later, this effect is even stronger if the neighborhood is high in concentrated disadvantage (the quadratic term for disadvantage was excluded from this equation as it was not significant). These estimates are plotted in Figure 3. These results are partially consistent with the hypothesis of Warner and colleagues, as the right side of this figure shows that instability has an increasingly deleterious effect on crime rates in high disadvantage tracts. However, the left side of the figure shows that even in relatively economically advantaged tracts, higher levels of instability are associated with lower rates of crime ten years later. There is simply little evidence here that residential instability has deleterious consequences ten years later. The pattern of this relationship was similar, though weaker, in the model with property crime as the outcome as the interaction was only significant at $p < .10$.¹⁴

Conclusion

This study explored the possible dynamic relationship between neighborhood structural characteristics and the rate of crime in those neighborhoods. This is the first study to explicitly test the feedback effect of crime on several neighborhood structural characteristics, and did so

14. Ancillary models including the spatial lag of residential stability, concentrated disadvantage, and their interactions did not appreciably improve the fit of the model and yielded substantively similar results. We therefore only present the results of the interaction models without these spatial lags.

with a large sample of over 2,500 tracts from 13 cities. Whereas prior research often assumes that crime cannot affect these structural characteristics, the evidence here suggests that this is not a reasonable assumption. Our findings imply that, if anything, crime shows a stronger effect on the change in the key neighborhood characteristic of residential stability than the reverse. These findings suggest that the use of cross-sectional tests of this relationship may lead to faulty conclusions. We next discuss our key findings.

First, we found evidence of reciprocal effects between a neighborhood's concentrated disadvantage and the rate of crime. Neighborhoods with more concentrated disadvantage experienced an increase in crime over the following decade, and neighborhoods with higher rates of violent crime experienced a greater increase in concentrated disadvantage. This latter finding has important implications for the large number of cross-sectional studies detecting a positive relationship between a neighborhood's level of poverty or concentrated disadvantage and its crime rate and assuming that disadvantage causes more crime. The evidence here suggests that crime can also change the desirability of a neighborhood and lead to an inflow of lower-income households. Nonetheless, it is worth noting that we detected a stronger effect of concentrated disadvantage on future crime than for the opposite effect.

We also saw evidence that crime may affect the general economic viability of neighborhoods. Neighborhoods with higher rates of crime experienced a decrease in general retail activity and an increase in the presence of bar and liquor store employees. Crime likely makes a neighborhood undesirable in general, chasing off desirable retail outlets, and leading to an influx of potentially undesirable ones such as liquor stores. At the same time, there was some evidence that the presence of bars and liquor stores generates more crime over time, suggesting a reinforcing process in which these businesses induce a downward cycle in neighborhoods.

A striking finding from this study is the evidence strongly refuting social disorganization theory's postulate that residential instability causes more crime. We found no evidence in support of this: in fact, neighborhoods with more instability experienced greater *decreases* in crime over the following decade. We observed this effect in relatively economically advantaged neighborhoods, and this effect was accentuated further in neighborhoods with high levels of concentrated disadvantage. This suggests that neighborhoods mired in concentrated disadvantage, in which the residents lack the ability to leave, are particularly vulnerable to increases in violence over time. We found no evidence that residential instability causes increases in crime over time. Furthermore, we saw strong evidence that neighborhoods with more crime experienced more vacant units over the subsequent decade, consistent with the hypothesis that households abandon such neighborhoods in an attempt to escape high levels of crime. These findings highlight that it may not be wise for cross-sectional studies to assume that any observed relationship between residential stability or vacant units and crime is not at least in part due to the effect of crime on households' mobility outcomes.

We found some evidence consistent with our hypothesis that neighborhoods with more crime would experience an increase in racial/ethnic heterogeneity. Neighborhoods with higher rates of violent crime experienced an increase in the proportion African Americans, as hypothesized. The fact that no such effect was detected for Latinos is consistent with evidence that Latinos generally experience lower levels of housing discrimination than African Americans. We also found that neighborhoods with more violent crime experienced an increase in racial/ethnic heterogeneity over the subsequent decade in models that did not account for the racial/ethnic heterogeneity of the neighboring tracts. The fact that this effect was not detected in the model including this spatially lagged measure may imply that such neighborhoods exist in a larger area undergoing a racial/ethnic transition. Furthermore, we highlight that there was no evidence that neighborhoods with more African Americans experienced an increase in crime over time. Thus, there is little evidence here that the commonly observed association between the presence of African Americans and crime is due to African Americans *causing* more crime. The evidence here instead suggests that general

segregation processes may push African Americans into undesirable, high crime neighborhoods.

Although this study has shown the importance of taking into account the dynamic nature of neighborhoods, certain limitations should be acknowledged. First, our sample was constrained to neighborhoods in 13 cities. While this provided us a relatively large sample size of about 2,500 census tracts, it is nonetheless the case that the generalizability of the results hinges on the extent to which the neighborhoods of these cities show a similar pattern to other cities throughout the United States. Second, we were constrained to one ten-year time period. The fact that crime rates were generally falling during this time period suggests that this was a relatively unusual time period. Nonetheless, the social disorganization theory has never been specified as unique to periods of stability, so there is no *a priori* reason why it should not be applicable during this period. In fact, if crime was generally increasing, we might posit that neighborhood crime would have shown an even stronger effect on mobility outcomes. Nonetheless, it would be useful for this model to be tested in other cities during other time periods to enhance confidence in the robustness of the results. Third, we were limited to a rather weak proxy for social disorder: the presence of liquor store and bar employees. Although the positive reciprocal relationship between this measure and crime rates over this ten-year period is suggestive, future studies will need to test this with a better measure. Fourth, we were constrained to considering ten-year lags for the relationship between crime and these neighborhood structural characteristics. Little work exists on the proper time lag for such questions. We have argued that the relative stability of neighborhoods implies that this might be a reasonable time period for exploring such questions, though this should be tested by future research employing more fine-grained temporal data.

In conclusion, our findings have important implications for understanding the dynamics of neighborhoods. Simply assuming that neighborhood structural characteristics causally induce their relationship with the level of crime is insufficient. There is a growing realization among scholars that such an assumption is untenable and that research needs to account for the dynamic nature of neighborhoods (Bursik 1988; Felson 2002; Miethe and Meier 1994; Skogan 1990). We have moved further in this direction, and our findings emphasize that the rate of crime in neighborhoods—particularly violent crime—can affect the residential mobility outcomes of the households within those neighborhoods. Linking this observation with the rich literature on both racial and economic segregation has important implications for how a neighborhood can change based on these key structural characteristics. Neighborhoods with more crime tend to experience increasing levels of residential instability, more impoverished residents, a worsening retail environment, and more racial/ethnic minorities and heterogeneity. Understanding this dynamic process of neighborhoods is an essential first step for understanding how to intervene in such neighborhoods.

Appendix

Table A1 • Cross-Lagged Models Using Tract Characteristics in 1990 to Predict Violent Crime and Neighborhood Structural Characteristics in 2000

Independent Variables in 1990	Violent Crime	Concentrated Disadvantage	African American	Latino	Ethnic Heterogeneity	Residential Instability	Occupied Units	Bars ^a Liquor Stores	Retail Employees
Violent crime	.777** (.013)	-.030 (.021)	.004* (.001)	.000 (.001)	.002 (.002)	-.075** (.020)	.023** (.003)	-.131** (.042)	-.019** (.005)
Violent crime squared		.006** (.002)				.013** (.002)	-.003** (.000)	.019** (.004)	
Spatially lagged outcome	.099** (.019)				.227** (.024)		.256** (.045)		
African American	-.308** (.068)	.320** (.049)	.872** (.009)	-.032** (.007)	-.207** (.010)	-.638** (.044)	.008 (.007)	-.372** (.100)	.063* (.032)
Latino	.123 (.099)	.265** (.070)	-.043** (.013)	.968** (.010)	-.319** (.014)	-.292** (.062)	.039** (.010)	.324* (.142)	.123** (.046)
Ethnic heterogeneity	.140 [†] (.080)	.143* (.057)	.051** (.011)	.096** (.008)	.737** (.015)	.009 (.050)	.035** (.008)	.140 (.116)	.066 [†] (.038)
Residential instability factor	-.053** (.019)	.057** (.012)	-.001 (.002)	-.011** (.002)	-.006** (.002)	.782** (.010)	-.002 (.002)	.021 (.024)	-.030** (.008)
Residential instability factor spatially lagged	-.129** (.021)								
Concentrated disadvantage	.219** (.032)	.693** (.016)	-.005 [†] (.003)	.013** (.002)	.028** (.003)	.121** (.014)	-.010** (.002)	-.007 (.033)	-.010 (.011)
Concentrated disadvantage squared	-.024** (.006)								
Occupied units	-.319 (.215)	.309 (.190)	.055 [†] (.029)	.076** (.022)	.039 (.031)	-.298 [†] (.160)	.141** (.023)	.110 (.313)	.253* (.101)
Bars/liquor stores per capita	.041** (.012)	-.012 (.009)	-.005** (.002)	-.001 (.001)	-.001 (.002)	-.011 (.008)	.001 (.001)	.732** (.018)	.007 (.006)
Retail establishments per capita	.064* (.027)	-.034* (.016)	.000 (.003)	-.010** (.002)	-.010** (.003)	.021 (.014)	-.001 (.002)	.263** (.031)	.909** (.010)
Retail establishments per capita spatially lagged	-.116** (.037)								
R-square	.888	.834	.939	.936	.797	.849	.464	.739	.881

Notes: Standard errors in parentheses; N = 2,534
p* < .05 *p* < .01 [†]*p* < .10 (two-tailed tests)

Table A2 • Cross-Lagged Models Using Tract Characteristics in 1990 to Predict Property Crime and Neighborhood Structural Characteristics in 2000

Independent Variables in 1990	Property Crime	Concentrated Disadvantage	African American	Latino	Ethnic Heterogeneity	Residential Instability	Occupied Units	Liquor Stores	Bars ϕ	Retail Employees
Property crime	.875** (.011)	.007 (.007)	.000 (.001)	-.002* (.001)	.000 (.002)	-.085** (.020)	.023** (.003)	-.102* (.041)		-.027** (.005)
Property crime squared						.011** (.002)	-.002** (.000)	.012** (.003)		
Spatially lagged outcome	.060** (.016)				.229** (.025)		.331** (.047)			
African American	-.201** (.050)	.371** (.047)	.874** (.009)	-.033** (.007)	-.216** (.010)	-.575** (.043)	-.010 (.007)	-.181† (.094)		.057† (.032)
Latino	.122† (.074)	.403** (.067)	-.027* (.013)	.967** (.010)	-.326** (.014)	-.192** (.061)	.012 (.010)	.500** (.137)		.124** (.047)
Ethnic heterogeneity	-.042 (.061)	.342** (.056)	.082** (.011)	.105** (.008)	.728** (.016)	.016 (.052)	.032** (.008)	.193† (.116)		.104** (.040)
Residential instability factor	-.020 (.014)	.079** (.012)	.000 (.002)	-.009** (.002)	-.003 (.002)	.770** (.011)	-.004* (.002)	.016 (.024)		-.034** (.008)
Residential instability factor spatially lagged	-.048** (.017)									
Concentrated disadvantage	.087** (.025)	.674** (.016)	-.008** (.003)	.014** (.002)	.030** (.003)	.144** (.014)	-.011** (.002)	-.007 (.032)		-.012 (.011)
Concentrated disadvantage squared	-.011* (.005)									
Occupied units	-1.877** (.706)	.692** (.201)	.067* (.033)	.125** (.025)	.059† (.035)	-.734** (.175)	.144** (.025)	.086 (.340)		.317** (.117)
Occupied units squared	1.121* (.469)									
Bars/liquor stores per capita	.030** (.009)	.009 (.009)	-.002 (.002)	.000 (.001)	-.002 (.002)	-.015† (.008)	.001 (.001)	.730** (.018)		.008 (.006)
Retail establishments	.061** (.021)	-.033* (.016)	.000 (.003)	-.010** (.002)	-.008* (.003)	.015 (.014)	.000 (.002)	.241** (.031)		.926** (.011)
Retail establishments per capita spatially lagged	-.207** (.030)									
R-square	.942	.844	.933	.938	.795	.847	.471	.740		.871

Notes: Standard errors in parentheses; $N = 2,342$
* $p < .05$ ** $p < .01$ † $p < .10$ (two-tailed tests)

References

- Adams, Richard E. 1992. "Is Happiness a Home in the Suburbs?: The Influence of Urban Versus Suburban Neighborhoods on Psychological Health." *Journal of Community Psychology* 20:353–71.
- Alba, Richard D. and John R. Logan. 1992. "Analyzing Locational Attainments: Constructing Individual-Level Regression Models Using Aggregate Data." *Sociological Methods & Research* 20:367–97.
- Alba, Richard D., John R. Logan, Brian J. Stults, Gilbert Marzan, and Wenquan Zhang. 1999. "Immigrant Groups in the Suburbs: A Reexamination of Suburbanization and Spatial Assimilation." *American Sociological Review* 64:446–460.
- Alba, Richard D., John R. Logan, and Paul E. Bellair. 1994. "Living with Crime: The Implications of Racial/Ethnic Differences in Suburban Location." *Social Forces* 73:395–434.
- Allison, Paul D. 1990. "Change Scores as Dependent Variables in Regression Analysis." *Sociological Methodology* 20:93–114.
- Bayoh, I., E. G. Irwin, and T. Haab. 2006. "Determinants of Residential Location Choice: How Important are Local Public Goods in Attracting Homeowners to Central City Locations?" *Journal of Regional Science* 46:97–120.
- Bellair, Paul E. 1997. "Social Interaction and Community Crime: Examining the Importance of Neighbor Networks." *Criminology* 35:677–703.
- . 2000. "Informal Surveillance and Street Crime: A Complex Relationship." *Criminology* 38:137–67.
- Bollen, Kenneth A. 1989. *Structural Equations with Latent Variables*. New York: John Wiley & Sons.
- Buck, Andrew J. and Simon Hakim. 1989. "Does Crime Affect Property Values?" *Canadian Appraiser* 33:23–27.
- Bursik, Robert J. 1986a. "Delinquency Rates as Sources of Ecological Change." Pp. 63–74 in *The Social Ecology*, edited by J. M. Byrne and R. J. Sampson. New York: Springer-Verlag.
- . 1986b. "Ecological Stability and the Dynamics of Delinquency." *Crime and Justice* 8:35–66.
- . 1988. "Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects." *Criminology* 26:519–51.
- Bursik, Robert J. and Harold G. Grasmick. 1992. "Longitudinal Neighborhood Profiles in Delinquency: The Decomposition of Change." *Journal of Quantitative Criminology* 8:247–63.
- Bursik, Robert J. Jr. and Jim Webb. 1982. "Community Change and Patterns of Delinquency." *American Journal of Sociology* 88:24–42.
- Crenshaw, Edward and Craig St. John. 1989. "The Organizationally Dependent Community: A Comparative Study of Neighborhood Attachment." *Urban Affairs Quarterly* 24:412–34.
- Cullen, Julie Berry and Steven D. Levitt. 1999. "Crime, Urban Flight, and the Consequences for Cities." *The Review of Economics and Statistics* 91:159–69.
- Cutler, David M., Edward L. Glaeser, and Jacob L. Vigdor. 1999. "The Rise and Decline of the American Ghetto." *The Journal of Political Economy* 107:455–506.
- Deane, Glenn D. 1990. "Mobility and Adjustments: Paths to the Resolution of Residential Stress." *Demography* 27:65–79.
- Dugan, Laura. 1999. "The Effect of Criminal Victimization on a Household's Moving Decision." *Criminology* 37:903–30.
- Epplé, Dennis and Holger Sieg. 1999. "Estimating Equilibrium Models of Local Jurisdictions." *The Journal of Political Economy* 107:645–81.
- Farley, Reynolds, Charlotte Steeh, Maria Krysan, Tara Jackson, and Keith Reeves. 1994. "Stereotypes and Segregation: Neighborhoods in the Detroit Area." *American Journal of Sociology* 100:750–80.
- Felton, Marcus. 2002. *Crime and Everyday Life*. Thousand Oaks, CA: Sage.
- Fischer, Mary J. and Douglas S. Massey. 2004. "The Ecology of Racial Discrimination." *City and Community* 3:221–41.
- Gerson, Kathleen, C. Ann Stueve, and Claude S. Fischer. 1977. "Attachment to Place." Pp. 139–61 in *Networks and Places: Social Relations in the Urban Setting*, edited by C. S. Fischer. New York: Free Press.
- Gibbs, Jack P. and Walter T. Martin. 1962. "Urbanization, Technology, and the Division of Labor: International Patterns." *American Sociological Review* 27:667–77.
- Gorman, Dennis M., Paul W. Speer, Paul J. Gruenewald, and Erich W. Labouvie. 2001. "Spatial Dynamics of Alcohol Availability, Neighborhood Structure and Violent Crime." *Journal of Studies on Alcohol* 62:628–36.

- Green, Howard Whipple and Leon E. Truesdell. 1937. *Census Tracts in American Cities*. Washington, DC: U.S. Department of Commerce, Bureau of the Census.
- Harris, David R. 2001. "Why Are Whites and Blacks Averse to Black Neighbors?" *Social Science Research* 30:100–16.
- Hartnagel, Timothy F. 1979. "The Perception and Fear of Crime: Implications for Neighborhood Cohesion, Social Activity, and Community Affect." *Social Forces* 58:176–93.
- Heitgerd, Janet L. and Robert J. Bursik, Jr. 1987. "Extracommunity Dynamics and the Ecology of Delinquency." *American Journal of Sociology* 92:775–87.
- Hipp, John R. 2007. "Income Inequality, Race, and Place: Does the Distribution of Race and Class within Neighborhoods affect Crime Rates?" *Criminology* 45:665–97.
- . 2009. "Specifying the Determinants of Neighborhood Satisfaction: A Robust Assessment in 24 Metropolitan Areas over Four Time Points." *Social Forces* 88:395–424.
- . Forthcoming. "Resident Perceptions of Crime: How Much is 'Bias' and How Much is Micro-Neighborhood Effects?" *Criminology*.
- Hipp, John R., George E. Tita, and Robert T. Greenbaum. 2009. "Drive-bys and Trade-Ups: The Impact of Crime on Residential Mobility Patterns in Los Angeles." *Social Forces* 87:1777–1812.
- Hirschman, Albert O. 1970. *Exit, Voice, and Loyalty; Responses to Decline in Firms, Organizations, and States*. Cambridge, MA: Harvard.
- Hu, Li-Tze and Peter M. Bentler. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives." *Structural Equation Modeling* 6:1–55.
- Kain, John F. and John M. Quigley. 1975. *Housing Markets and Racial Discrimination: A Microeconomic Analysis*. New York: National Bureau of Economic Research.
- Kasarda, John D., Stephen J. Appold, Stuart H. Sweeney, and Elaine Sieff. 1997. "Central-City and Suburban Migration Patterns: Is a Turnaround on the Horizon?" *Housing Policy Debate* 8:307–58.
- Kelling, George and Catherine Coles. 1996. *Fixing Broken Windows: Restoring Order and Reducing Crime in our Communities*. New York: Free Press.
- Krivo, Lauren J. and Ruth D. Peterson. 1996. "Extremely Disadvantaged Neighborhoods and Urban Crime." *Social Forces* 75:619–48.
- Kubrin, Charis E. and Jerald R. Herting. 2003. "Neighborhood Correlates of Homicide Trends: An Analysis Using Growth-Curve Modeling." *The Sociological Quarterly* 44:329–50.
- La Gory, Mark and John Pipkin. 1981. *Urban Social Space*. Belmont, CA: Wadsworth.
- Lander, Bernard. 1954. *Towards an Understanding of Juvenile Delinquency*. New York: Columbia.
- Lipton, Robert and Paul Gruenewald. 2002. "The Spatial Dynamics of Violence and Alcohol Outlets." *Journal of Studies on Alcohol* 63:187–95.
- Liska, Allen E., John R. Logan, and Paul E. Bellair. 1998. "Race and Violent Crime in the Suburbs." *American Sociological Review* 63:27–38.
- Liska, Allen E. and Paul E. Bellair. 1995. "Violent-Crime Rates and Racial Composition: Convergence Over Time." *American Journal of Sociology* 101:578–610.
- Logan, John R., Richard D. Alba, and Shu Yin Leung. 1996. "Minority Access to White Suburbs: A Multi-regional Comparison." *Social Forces* 74:851–81.
- Lyons, William E. and David Lowery. 1986. "The Organization of Political Space and Citizen Responses to Dissatisfaction in Urban Communities: An Integrative Model." *The Journal of Politics* 48:321–46.
- Markowitz, Fred E., Paul E. Bellair, Allen E. Liska, and Jianhong Liu. 2001. "Extending Social Disorganization Theory: Modeling the Relationships Between Cohesion, Disorder, and Fear." *Criminology* 39:293–319.
- Massey, Douglas S. and Brendan P. Mullan. 1984. "Processes of Hispanic and Black Spatial Assimilation." *American Journal of Sociology* 89:836–73.
- McNulty, Thomas L. 2001. "Assessing the Race-Violence Relationship at the Macro Level: The Assumption of Racial Invariance and the Problem of Restricted Distributions." *Criminology* 39:467–89.
- Miethe, Terance D. and Robert F. Meier. 1994. *Crime and its Social Context: Toward an Integrated Theory of Offenders, Victims, and Situations*. Albany: State University of New York Press.
- Morenoff, Jeffrey D. and Robert J. Sampson. 1997. "Violent Crime and The Spatial Dynamics of Neighborhood Transition: Chicago, 1970–1990." *Social Forces* 76:31–64.
- Nielsen, Amie L. and Ramiro Martinez. 2003. "Reassessing the Alcohol-Violence Linkage: Results from a Multiethnic City." *Justice Quarterly* 20:445–69.
- Oliver, Pamela. 1984. "If You Don't Do It, Nobody else will." *American Sociological Review* 49:601–10.
- Orbell, John M. and Toru Uno. 1972. "A Theory of Neighborhood Problem Solving: Political Action vs. Residential Mobility." *The American Political Science Review* 66:471–89.

- Ouimet, Marc. 2000. "Aggregation Bias in Ecological Research: How Social Disorganization and Criminal Opportunities Shape the Spatial Distribution of Juvenile Delinquency in Montreal." *Canadian Journal of Criminology* 42:135–56.
- Parkes, Alison, Ade Kearns, and Rowland Atkinson. 2002. "What Makes People Dissatisfied with their Neighborhoods?" *Urban Studies* 39:2413–38.
- Perkins, Douglas D., Paul Florin, Richard C. Rich, Abraham Wandersman, and David M. Chavis. 1990. "Participation and the Social and Physical Environment of Residential Blocks: Crime and Community Context." *American Journal of Community Psychology* 18:83–115.
- Peterson, Ruth D., Lauren J. Krivo, and Mark A. Harris. 2000. "Disadvantage and Neighborhood Violent Crime: Do Local Institutions Matter?" *Journal of Research in Crime and Delinquency* 37:31–63.
- Pyle, Gerald F. 1974. *The Spatial Dynamics of Crime*. Vol. 159. Chicago: University of Chicago, Department of Geography.
- Quillian, Lincoln. 1999. "Migration Patterns and the Growth of High-Poverty Neighborhoods, 1970–1990." *American Journal of Sociology* 105:1–37.
- Rengert, George F., Alex R. Piquero, and Peter R. Jones. 1999. "Distance Decay Reexamined." *Criminology* 37:427–45.
- Roncek, Dennis W. 1981. "Dangerous Places: Crime and Residential Environment." *Social Forces* 60:74–96.
- Roncek, Dennis W. and Pamela A. Maier. 1991. "Bars, Blocks, and Crimes Revisited: Linking the Theory of Routine Activities to the Empiricism of 'Hot Spots'." *Criminology* 29:725–53.
- Rosenbaum, Emily. 1994. "The Constraints on Minority Housing Choices, New York City 1978–1987." *Social Forces* 72:725–47.
- Rosenbaum, Emily and Grigoris Argeros. 2005. "Holding the Line: Housing Turnover and the Persistence of Racial/Ethnic Segregation in New York City." *Journal of Urban Affairs* 27:261–81.
- Sampson, Robert J. 1991. "Linking the Micro- and Macrolevel Dimensions of Community Social Organization." *Social Forces* 70:43–64.
- Sampson, Robert J. and John D. Wooldredge. 1986. "Evidence that High Crime Rates Encourage Migration away from Central Cities." *Sociology and Social Research* 70:310–14.
- Sampson, Robert J. and Patrick Sharkey. 2008. "Neighborhood Selection and the Reproduction of Concentrated Racial Inequality." *Demography* 45:1–29.
- Sampson, Robert J. and Stephen W. Raudenbush. 1999. "Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods." *American Journal of Sociology* 105:603–51.
- . 2004. "Seeing Disorder: Neighborhood Stigma and the Social Construction of 'Broken Windows'." *Social Psychology Quarterly* 67:319–42.
- Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls. 1997. "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 277:918–24.
- Sampson, Robert J. and W. Byron Groves. 1989. "Community Structure and Crime: Testing Social-Disorganization Theory." *American Journal of Sociology* 94:774–802.
- Schelling, Thomas C. 1978. *Micromotives and Macrobehavior*. New York: W. W. Norton & Co.
- Schuerman, Leo and Solomon Kobrin. 1986. "Community Careers in Crime." *Crime and Justice* 8:67–100.
- Schwartz, Amy Ellen, Scott Susin, and Ioan Voicu. 2003. "Has Falling Crime Driven New York City's Real Estate Boom?" *Journal of Housing Research* 14:1–35.
- Shaw, Clifford and Henry D. McKay. 1942. *Juvenile Delinquency and Urban Areas*. Chicago: University of Chicago Press.
- Skogan, Wesley G. 1989. "Communities, Crime, and Neighborhood Organization." *Crime & Delinquency* 35:437–57.
- . 1990. *Disorder and Decline: Crime and the Spiral of Decay in American Neighborhoods*. New York: Free Press.
- Skogan, Wesley G. and Michael G. Maxfield. 1981. *Coping with Crime: Individual and Neighborhood Reactions*. Vol. 124. Beverly Hill, CA: Sage.
- Smith, William R., Sharon Glave Frazee, and Elizabeth L. Davison. 2000. "Furthering the Integration of Routine Activity and Social Disorganization Theories: Small Units of Analysis and the Study of Street Robbery as a Diffusion Process." *Criminology* 38:489–523.
- South, Scott J. and Kyle D. Crowder. 1997a. "Escaping Distressed Neighborhoods: Individual, Community, and Metropolitan Influences." *American Journal of Sociology* 102:1040–84.
- . 1997b. "Residential Mobility Between Cities and Suburbs: Race, Suburbanization, and Back-to-the-City Moves." *Demography* 34:525–38.

- South, Scott J. and Glenn D. Deane. 1993. "Race and Residential Mobility: Individual Determinants and Structural Constraints." *Social Forces* 72:147–67.
- South, Scott J. and Steven F. Messner. 2000. "Crime and Demography: Multiple Linkages, Reciprocal Relations." *Annual Review of Sociology* 26:83–106.
- Speare, Alden Jr. 1974. "Residential Satisfaction as an Intervening Variable in Residential Mobility." *Demography* 11:173–88.
- Speare, Alden Jr., Frances Kobrin, and Ward Kingkade. 1982. "The Influence of Socioeconomic Bonds and Satisfaction on Interstate Migration." *Social Forces* 61:551–74.
- Swaroop, Sapna and Jeffrey D. Morenoff. 2006. "Building Community: The Neighborhood Context of Social Organization." *Social Forces* 84:1665–95.
- Taylor, Ralph B. 1996. "Neighborhood Responses to Disorder and Local Attachments: The Systemic Model of Attachment, Social Disorganization, and Neighborhood Use Value." *Sociological Forum* 11:41–74.
- . 2001. *Breaking Away from Broken Windows: Baltimore Neighborhoods and the Nationwide Fight Against Crime, Grime, Fear, and Decline*. Boulder, CO: Westview.
- Taylor, Ralph B., Stephen D. Gottfredson, and Sidney Brower. 1984. "Block Crime and Fear: Defensible Space, Local Social Ties, and Territorial Functioning." *Journal of Research in Crime and Delinquency* 21:303–31.
- Thaler, Richard. 1978. "A Note on the Value of Crime Control: Evidence from the Property Market." *Journal of Urban Economics* 5:137–45.
- Tita, George E., Tricia L. Petras, and Robert T. Greenbaum. 2006. "Crime and Residential Choice: A Neighborhood Level Analysis of the Impact of Crime on Housing Prices." *Journal of Quantitative Criminology* 22:299–317.
- Turner, Margery A., Stephen Ross, George C. Galster, and John Yinger. 2000. "Discrimination in Metropolitan Housing Markets: National Results from Phase I HDS 2000." Washington, DC: U.S. Department of Housing and Urban Development.
- Warner, Barbara D. and Glenn L. Pierce. 1993. "Reexamining Social Disorganization Theory Using Calls to the Police as a Measure of Crime." *Criminology* 31:493–517.
- Warner, Barbara D. and Pamela Wilcox Rountree. 1997. "Local Social Ties in a Community and Crime Model: Questioning the Systemic Nature of Informal Social Control." *Social Problems* 44:520–36.
- Wilson, James Q. and George Kelling. 1982. "Broken Windows: The Police and Neighborhood Safety." *Atlantic Monthly*:10.
- Wolfgang, Marvin E., Robert M. Figlio, Paul E. Tracy, and Simon I. Singer. 1985. "National Survey of Crime Severity." Washington, DC: Government Printing Office.
- Zimring, Franklin E. 1997. *Crime is not the Problem*. New York: Oxford.