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Urban Poverty and Neighborhood Effects on Crime: Incorporating Spatial and Network Perspectives

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Abstract

Research on neighborhoods and crime is on a remarkable growth trajectory. In this article, we survey important recent developments in the scholarship on neighborhood effects and the spatial stratification of poverty and urban crime. We advance the case that, in understanding the impact of neighborhoods and poverty on crime, sociological and criminological research would benefit from expanding the analytical focus from residential neighborhoods to the *network of neighborhoods* individuals are exposed to during their daily routine activities. This perspective is supported by reemerging scholarship on activity spaces and macro-level research on inter-neighborhood connections. We highlight work indicating that non-residential contexts add variation in criminogenic exposure, which in turn influence offending behavior and victimization risk. Also, we draw on recent insights from research on gang violence, social and institutional connections, and spatial mismatch, and call for advancements in the scholarship on urban poverty that investigates the salience of inter-neighborhood connections in evaluating the spatial stratification of criminogenic risk for individuals and communities.

Introduction

Since the beginning of the 20th century, urban scholars have extensively studied the role of urbanism and poverty in increasing crime. Rapid urban growth and population mobility together with stark socioeconomic differentiations across the urban space were, from the early years of the Chicago School, associated with the breakdown of social control and increased crime (Zorbaugh 1929). Classic ecological studies showed that neighborhoods with high poverty near commercial and industrial districts exhibited the highest levels of delinquency and criminality (Shaw and McKay 1942). These levels persisted over decades even when neighborhood population groups changed dramatically, indicating that structural

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conditions like neighborhood poverty contributed to delinquency and crime above and beyond individual disposition.

In the late-20th century, industrial restructuring and suburban flight has exacerbated the spatial differentiation of resources and concentration of unemployment among the low-skilled. In *The Truly Disadvantaged*, Wilson (1987) noted that unemployment and poverty clustered and that together these 'concentration effects' weakened family bonds and institutional ties, undermining the formal and informal capacity for crime control. Scholars today refer to areas of *high poverty* as areas *of concentrated disadvantage*. The Great Recession of 2008 added greater strain to struggling low-income urban communities across the country and recent studies increasingly connect economic distress (e.g. foreclosures) to higher crime (Ellen et al. 2013; see Arnio and Baumer 2012 for an exception).

Building on a century old tradition of research, research on neighborhoods and crime in the past decade has shown remarkable growth. More than 250 articles were published on this topic in 2012 alone (Figure 1). The scholarship on place, space, and geography in relation to crime exhibited similar trajectories. Combined, this literature demonstrates that neighborhood poverty and related social and economic conditions are closely related to multiple indices of criminal exposure and offending. Specifically, studies find that neighborhood poverty and associated structural factors continue to predict multiple crime-related outcomes, including: individuals' exposure to violence (Bingenheimer et al. 2005; Sampson et al. 1997); risk of victimization (Burchfield and Silver 2013); adolescent violent crime (De Coster et al. 2006; Zimmerman and Messner 2010); aggression (Molnar et al. 2008); arrests for violent behavior (Ludwig et al. 2000); domestic violence (Benson et al. 2003); incarceration (Rodriguez 2013); and recidivism (Kubrin and Stewart 2006). With few exceptions, these patterns tend to hold in multiple cities and in nationally representative studies.

Most studies implicitly assume that exposures to risk (e.g. criminal offending or victimization) are sufficiently represented by attributes of the neighborhood of residence. Chaix (2009) refers to this as the "residential trap." However, the residential focus ignores the fact that individuals' routines, in the aggregate, expose them to different neighborhoods on a daily basis. Few studies have examined the implications of routine exposures to multiple, non-residential neighborhood locations for crime. In this paper, we address this gap and advance a case for the idea that a more complete understanding of neighborhood effects on crime will greatly benefit from moving beyond the traditional focus on residential exposure to research based on an individual's exposure to *networks of neighborhoods*. In building our argument, we draw on classic and modern theorizing on neighborhood effects and the spatial differentiation of poverty and crime, and integrate it with re-emerging literature on activity spaces, inter-neighborhood connections, and social and institutional networks.

Neighborhood effects on crime

In this section, we review some of the core mechanisms and associated theoretical perspectives that have been proposed to account for observed neighborhood effects. We

discuss issues related to the definition of the neighborhood, scales of spatial exposures, and the spatial clustering of neighborhood disadvantage across urban environments.

Internal neighborhood mechanisms

Several major theoretical perspectives shed light on some of the possible mechanisms underlying the neighborhood effects on crime. First, one of the oldest theoretical perspectives, social disorganization, posits that ecological conditions like socioeconomic disadvantage, racial heterogeneity, and residential mobility, erode neighborhood social control and facilitate crime (Shaw and McKay 1942). Social control largely operates through local ties to other individuals and institutions (Bursik and Grasmick 1993). A later extension of this theory proposes that independent of social ties, collective efficacy—a combination of social cohesion, trust and the ability of neighborhood residents to realize common goals and values—reduces neighborhood crime (Sampson et al. 1997). Second, a perspective that is gaining increasing traction recently, routine activities states that crimes are most common when motivated offenders intersect in time and space with attractive targets in the absence of guardianship (Cohen and Felson 1979). Often, routine activities components are assessed through measures such as unemployment rate (a proxy for motivated offenders) and time spent out of the household (low level of guardianship). Third, subcultural theories propose that local value structures can promote crime (Fischer 1975), the focus being on "urban," "street" and a "southern" culture of violence. Finally, relative deprivation or strain approaches suggest that socioeconomic standing relative to peers or neighbors may influence offending behavior (Merton 1938). In empirical tests of these theories, indicators of social disorganization and routine activities are found to exhibit the strongest and most consistent effects on crime (for a meta-analysis, see Pratt and Cullen 2005). Valuable reviews of social disorganization research and related theoretical thinking on neighborhood effects together with important suggestions for future directions are offered by Sampson et al. (2002) and Kubrin and Weitzer (2003).

The main social mechanisms have been summarized by Sampson and collaborators (2002) under four categories: *social ties and local interactions*, referring to local interpersonal networks of friends and kin and neighborly exchanges; *norms and collective efficacy*, based on different dimensions of culture, social cohesion, trust, and social control (Sampson et al. 1997); *institutional resources*, which include neighborhood organizations, family wellbeing support centers, youth centers and the like; and *routine activities* (Cohen and Felson 1979), referring to the mix of residential, commercial or industrial land use and also the pattern of daily routine activities which facilitate access to local desirable targets by potential offenders living outside the neighborhood. The latter encompasses *spatial mismatch* theory (Kain 1968), which highlights the distance between home and workplaces among population subgroups, a phenomenon also understood as *institutional isolation* (Wilson 1987).

These dimensions of neighborhood processes, while analytically distinct, are empirically related. Yet few studies have examined the nature and extent of these relationships. Sampson and Graif's study (2009b) is an exception that investigated the *social networks* of friends and kin and reciprocal exchange, *collective efficacy* (the ability of residents to realize common goals), *culture* (norms of conduct for different age groups), *institutional engagement*

(neighborhood activism, involvement in local organizations, schools, and churches) and *neighborhood leader contacts within and outside* the community. They concluded that "as residents seem to disengage and are more cynical in disadvantaged communities, community leaders become more intensely involved in seeking resources, often from afar" (Sampson and Graif 2009b, p. 1601). Independent of disadvantage, another study found that internal community network structures are positively associated with trust among leaders and among residents (Sampson and Graif 2009a). When networks extending *outside* the community shape the density of *internal* networks (Sampson 2012), we might expect additional improvements in trust and other dimensions of social order. This literature implies important, yet understudied, relationships between the private or parochial levels of control and the external, public level (Hunter 1985, detailed below) with consequences for control of crime especially in disadvantaged communities.

Despite great advancements on the theoretical and empirical testing of neighborhood level mechanisms, we agree with Kubrin and Weitzer's (2003, p. 387) assessment that "compared to the large number of studies on the effects of intra-neighborhood factors on crime, surprisingly little attention has been given to the role of exogenous determinants, and very little is known about the connections and interactions between internal and external factors. This would be a fruitful avenue for future research, and would rightly expand the scope of social disorganization theory in a more macro direction." Below, we present important recent developments relevant to bridging the internal-external mechanisms gap and offer additional suggestions for the future.

Neighborhood definitions and scales of spatial exposures

Over 40 years ago, Hunter and Suttles (1972) stressed the importance of multiple scales of measurement. They identify four scales: the *"face-block,"* where residents tend to know each other; the "*defended neighborhoods,*" the smallest areas with distinct identities recognized by outsiders and insiders; the "*community of limited liability,*" where local participation depends on residents' attachment to community; and the "*expanded communities of limited liability,"* a large geographic area in which groups of residents come together only when needed to gain larger traction on specific political or economic decisions. Importantly, each of these traditions uses pre-defined, administratively-bounded areas. Since the 1970s much of the measurement of neighborhoods in crime research spanned the meso-to-macro scales, from census tracts (Graif and Sampson 2009) to community areas (Sampson and Graif 2009a, 2009b) to counties (Messner and Anselin 2004). More recent studies have made important advances at the micro-level too, illustrating the importance of local network groupings (Hipp et al. 2012), blocks (Hipp 2007) and *street segment* dynamics (Weisburd et al. 2004) in shaping crime.

A limited but growing number of studies, however, have adopted a different framework altogether—eliminating dependence on administrative boundaries. These researchers define neighborhoods egocentrically, as the geographic context around an individual's residence or around a block independent of neighborhood administrative boundaries (Hipp and Boessen 2013). The features of the surroundings that are closest geographically to the focal residence are assumed to be most influential (Tobler 1970). Work in geography also has used kernel

density analyses and routines that treat the world as a continuous surface (Matthews 2011). A major advantage of these analytic frameworks is an acknowledgment that access to resources is often facilitated by geographic proximity (e.g. access to youth services may decrease delinquent behavior) independent of artificially defined neighborhood boundaries.

The bounded neighborhood approach and the respondent-centered approach fed recurrent debates about the "proper" definition of the neighborhood. We believe this is a false dichotomy that may distract from thinking in an integrative way about local social processes. Similarly, the debates over the correct geographic scale of the neighborhood mask an important point: certain features of the surrounding non-residential areas may matter above and beyond the residential neighborhood, however defined. We revisit the four types of mechanisms noted by Sampson and colleagues (2002) with respect to the immediate neighborhoods of residence in the first column of Table 1. Additionally, we expand further to illustrate how these types of processes may interact in shaping individuals' victimization experiences and offending behavior with features of a) the broader area surrounding the immediate neighborhood of residence (the extended neighborhood, column two) and b) the neighborhoods frequented as part of peoples' daily routine activities (e.g. the neighborhood of workplace or of close friends, column three). These examples may be translated into research hypotheses in future studies.

The spatial embeddedness of neighborhoods

It has long been shown, in multiple cities, that poverty and crime are both associated with each other and exhibit spatial clustering (Peterson and Krivo 2010). In addition, social processes like neighborhood trust and collective efficacy also cluster in space, and the spatial covariation between poverty and neighborhood processes remained strong over the past four decades (Sampson and Graif 2009a). Moreover, the *associations* between neighborhood poverty and crime tend to be similar for multiple neighborhoods that are geographically proximate to each other, even though they vary from one section of the city to another (Graif and Sampson 2009).

Given the progress in highlighting the ecological levels of covariation between poverty and crime, it is surprising that advances in our collective understanding of spatial dynamics at the ecological level have not been integrated into the analytical framework of neighborhood effects on individuals (for an exception, see Sampson et al. 1999). This gap is related to the fact that we still know little about the processes underlying observed spatial clustering (Kubrin and Weitzer 2003). These patterns are in part attributed to measurement issues and in part to processes of contagion or diffusion, whereby nearby crime activity spills over neighborhood boundaries (Anselin et al. 2000; Tita and Griffiths 2005). Other processes assumed to explain clustering are residents' daily movement and increased exposures to risk factors in nearby neighborhoods. To the extent that effects of spatial proximity are in large part due to overlapping activity spaces, a more general form of interdependence—which transcends geographic proximity while subsuming some aspects of it—may be inter-neighborhood connections forged as a result of individuals' frequent movement (e.g. daily commuting) across space.

Non-residential neighborhoods and routine activity spaces

Individuals routinely travel outside the neighborhood of residence for leisure and work. Pathways of movement across large distances may increase variability of access to resources, institutions, information, and people in ways that may affect crime. Furthermore, much of the time spent in the neighborhood of residence is spent inside the home, when the objective risk of committing crime or being victimized is arguably low (Bureau of Labor Statistics 2013). Despite increasing calls for definitions of neighborhood context that take into account individuals' daily activity patterns (Cagney et al. 2013; Matthews 2011; Matthews and Yang 2013), most social science literature still relies on census tract of residence as the operational definition for the neighborhood of influence. However, research on the journey to crime indicates that up to 70 percent of crimes are committed by individuals outside their neighborhood of residence (Bernasco 2010; Wikström 1991, p. 213-223). Moreover, compared to violent crime, property crimes are committed further away from offenders' neighborhoods of residence (White 1932). Additionally, Bernasco (2010) finds that locations where offenders lived in the past are more likely to be chosen as the location of current offending. Evidence on the importance of non-residential contexts in the study of crime is thus becoming increasingly more salient.

The argument that researchers need to focus on relevant contexts other than the neighborhood of residence is not new to sociology (e.g. Foley 1950). McClenahan (1929) was one of the first to argue that urban residents' activities are rarely located within the immediate vicinity of the home. Routine activity patterns have been shown to matter for individuals' outcomes. Inagami and colleagues (2007) suggest that the negative effects on health of living in disadvantaged neighborhoods may be confounded and suppressed by exposure to non-disadvantaged, non-residential neighborhoods in the course of routine daily activities (i.e. grocery shopping). More recently, both qualitative and quantitative research in sociology has highlighted the importance of nonresidential contexts (Matthews, 2011). Other disciplines too have started to adopt activity space approaches and are beginning to focus on nonresidential neighborhoods (Cagney et al. 2013; Zenk et al, 2011). To date however, few studies have assessed the impact of individual activity spaces on the propensity to commit crime or become the victim of crime.

One notable exception is a recent study of youth in a UK city (Wikström et al. 2010), which showed that more than 54% of respondents' awake time was spent outside their home area (Figure 2). Those with higher propensities for crime were exposed more frequently to criminogenic settings outside their home and school areas and, in such settings, were more likely to become involved in criminal behavior. More than half of the respondents' crimes were committed at locations central to their routine activities. These findings highlight the importance of designing new studies that do not rely on residential contexts as the only purveyor of *contextual* effects.

Networks of neighborhood exposures

The work on the importance of non-residential neighborhoods on crime and victimization provides some evidence for the necessity to study neighborhoods not as isolated,

independent places but rather as parts of a larger, interconnected network of places. This type of perspective also has roots in earlier sociology, geography, and planning (see Matthews 2008). In the early sixties sociologists wrote about the “community without propinquity” or spatially dispersed communities (Webber 1963) . Later Wellman (1979) discussed “community liberation”, extended social networks, and long distance communications such as “networks in the global village” (Wellman 1999) which provides a bridge to the “new mobilities research” paradigm (Larsen et al. 2012). We reintroduce and emphasize the idea that neighborhoods are part of a larger system of resource exchanges, in the form of networks, between places.

Our network perspective also draws on Hunter’s (1985) discussion of the importance of three core types of relational networks in shaping neighborhood social control. The “private” social order refers to intimate informal primary ties within a neighborhood (e.g. kin and friends) which can control crime through the threat of social disproval or other forms of deprivation. The “parochial” order is given by the broader connections with local institutions such as schools, churches, or community organizations, characterized by weaker attachment than the primary networks but nonetheless important. Finally, the “public” social order describes a community’s connections to external organizations and institutions that facilitate the mobilization of resources, mediate the ability of local networks to control local crime, and sometimes even enable the foundation of local institutions (also Taub et al. 1977).

The literature to date has predominantly focused on the private or parochial dimension of crime control, with little attention to the public dimension (Bursik and Grasmick 1993). Interestingly, the private and parochial ties often extend across space to create the foundation for public control. In a creative approach to neighborhoods as inter-related friendship networks, Hipp and colleagues (2012) show that while a high proportion of teens’ friends are predictably spatially clustered, many ties cross neighborhood boundaries over large geographic distances. To the extent that individuals’ contextual exposures are defined through their interactions, these findings underscore that a focus on only the administrative area of residence would miss substantial exposures to many friends’ neighborhoods.[1]

The extent of between-neighborhood connections in Chicago are investigated in a recent monograph, Sampson's (2012) *Great American City*, as a function of residential mobility and nominations of influential people. Sampson (2012, pp. 309-310) finds it surprising "how little neighborhood networks have actually been studied, as opposed to being invoked in metaphorical terms. … [P]rior research is dominated by a focus on individual connections and an “egocentric” perception of social structure. … [R]arely has social science documented variations *between* communities in social networks, much less the citywide structure."

A recent article by Slocum and colleagues (2013) addresses in part this gap by showing that organizations whose function it is to bridge to the larger community and secure resources for the local residents (e.g. community boards, political groups, economic development centers)

[1]While a focus on networks as neighborhoods is valuable, we would also caution that the *absence* of friendships could alternatively activate criminogenic processes like alienation and anomie.

are significantly associated with lower violent and property crime, even after controlling for multiple features of the community. Still, few empirical studies exist that show how neighborhoods are connected and more specifically how these ties matter for crime related outcomes. Just as residential neighborhood contexts matter to individuals through their connections with institutions and organizations within it (Tran et al. 2013), similarly, involvement in non-residential neighborhoods may be consequential for criminal behavior or victimization risk.

Broader social phenomena highlight the importance of the interconnectedness of neighborhoods. For example, economic declines have been found to play a role in increasing violence (Catalano et al. 2011; Ellen et al. 2013) but the evidence tends to be mixed and little is understood about the underlying mechanisms. We suggest that through plant closures and mass layoffs, recessions may sever critical interaction pathways (i.e. resource exchange in the form of labor) between neighborhoods. Despite a long tradition of research on spatial mismatch in employment prospects (Kain 1968), understanding violence in the context of a neighborhood's connectivity to or isolation from other particularly influential communities in the city is underexplored.

In sum, as individuals move about space and across neighborhoods within urban contexts, patterns of behavior aggregate to create functional ties between sets of neighborhoods. Such ties may turn out to be as important for neighborhood change as spatial proximity is observed to be. In other words, underlying (or complementing) the spatial clustering of poverty and crime among neighborhoods in a city may be a broader network structure of interdependence governed by how people routinely move through the urban landscape. To the extent that communities are connected to others who are successful in dealing with crime, those strategies and tools may be transmitted through such ties (i.e. innovation diffusion).

Methodological considerations in the study of neighborhood networks

The empirical study of "networks of neighborhoods" is relatively new and underdeveloped. While we cannot offer definite approach to the study of neighborhood networks, we provide some guidance based on prior research and the emergence of data and methods to study complex networks. We highlight five relevant macro-level studies and their commonalities and differences along six dimensions: the nodes (neighborhoods) and the ties (relationships between nodes) as units of analysis; the levels of analysis; the type of analysis; the type of data used; and the questions of interest. This information is intended to provide readers with an overview of the types of methodological choices when designing a study of neighborhood networks.

In the networks of neighborhood approach, the nodes, or units of analysis, are frequently a geographic subdivision. In our selected examples, the operational definition of nodes range from administrative definitions of "neighborhoods" of the Paris Commune in the late nineteen century and community areas in contemporary Chicago (Gould 1991; Sampson 2012) to tracts (Schaefer 2012) and more complex units like gang turfs (Papachristos et al. 2013). The definition and measurement of the ties between nodes - arguably the main focus

of a networks approach to neighborhoods – vary as a function of the research question. In Gould's (1991) study, ties were represented by the number of men living in a neighborhood serving in the same military units as residents of another neighborhood. Papachristos and colleagues (2013) and Schaefer (2012) represented ties as gang violence and criminal co-offending relationships between places, respectively. Sampson (2012) measured ties as nominations by political leaders of people in the city who they believed they could rely on to "get things done" in their community. Thus, the core requirement of a tie is that it represent a form of meaningful interaction or relationship between nodes (see Table 2).

The level of analysis is typically macro because of the interest in *inter-neighborhood* interactions or how neighborhoods are connected. All the studies we selected examined exchanges between macro-level units defined as a neighborhood. Data sources vary depending on the topic of interest, though some common themes emerge from the types of data used. Three of the studies (Gould 1991; Papachristos et al. 2013; Schaefer 2012) used archival records whereas Sampson (2012) used a prospectively longitudinal survey format to collect data. Other types of data that link places to other places - including but not limited to resource exchange (e.g. financial exchange; commuting to work), criminal exchange (e.g. court records of co-offenders' neighborhoods of residence; police reports linking offenders' or victims' address and crime location), or political exchange (e.g. nominations of "movers and shakers;" political interactions) - can be used to assess neighborhood networks. As an example, one ongoing study (Author 2013) uses police records and administrative data to connect employers' location and employees' neighborhood of residence to examine the extent to which commuting to violent neighborhoods increases victimization rates among the residents of a focal neighborhood (Figure 3).

The leftmost map represents Chicago's 77 community areas while the middle and the rightmost maps are network representations of the communities in the highest thirtile (red nodes) and lowest thirtile of violence (green nodes), respectively. Community areas are represented as nodes and situated in geographic space according to the latitude and longitude coordinates of their centroids. Ties between nodes represent workers living in one neighborhood and commuting to the other. The arrows point toward the neighborhood of work and show the extent to which communities of similar violence level are connected to each other or not. This ecological perspective on networks of communities opens the field to new perspectives on age-old questions related to structural embeddedness, selection and exclusion, displacement of crime, and the diffusion of norms relevant for crime control (see also column 3 of Table 1).

With respect to modeling and analytical approaches, all of the selected studies use a combination of GIS mapping, spatial, and network analyses. These methods are used to assess how different types of neighborhoods are distributed over space, to calculate the geographic distance between them, and to assess the association between social and spatial distance on the one hand and prevalence of inter-neighborhood connections on the other. The network analyses use two different approaches: a) a nodal approach (Gould 1991) where the outcome and most covariates are modeled egocentrically at the nodal level while the dyadic relationships are only summarized in the form of a network autocorrelation term, similar to a spatial autocorrelation term, and, b) a dyadic and structural approach, using exponential

random graph models (ERGMs), where the outcome is at the tie level as are many covariates, but nodal attributes and structural properties of the overall network are also included (Papachristos et al 2013; Schaefer 2012).

Not represented among these examples, but nonetheless an important approach for the future that allows for changes in the network structure over time, is modeling using SIENA (Snijders 2001). A relatively recent development, SIENA is gaining traction in examining longitudinal networks at the individual level but little research so far has made use of it in examining change in a network of neighborhoods. For instance, one type of question that this strategy would help address in the future is whether increases in neighborhood unemployment contribute to subsequent increases in co-offending relationships between any two neighborhoods or whether co-offending occurs before or independent of increases in unemployment. Other types of questions may focus on the diffusion of crime between neighborhoods (how shots fired across neighborhoods may lead to further shootings in retaliation) or on crime displacement (how policing in a neighborhood pushes crime into new places) (Tita and Cohen 2004). In sum, while the macro-level study of networks of neighborhoods is still in its early stages, existing examples are encouraging.

When the primary interest focuses on individual behaviors, experiences, and outcomes related to crime and victimization, studies of neighborhood network effects may combine network analytic tools with more typical approaches to the study of neighborhood effects or peer influences. Just like exposure to a network of delinquent friends affects individuals' attitudes and delinquent behavior, exposure to criminogenic places in which individuals spend considerable time (whether their own neighborhood of residence or outside it) may shape their attitudes and behavior. The mechanisms of peer influence on individual behavior may only in part overlap, if at all, with the mechanisms of place influence. Yet, the methodological advancements in assessing the role of one's network of peers (Kreager et al. 2011) may also be valuable to scholars interested in assessing the role of an individual's network of neighborhoods.

The logic of the typical multilevel approach, for instance, as used in estimating effects of peer groups or of residential neighborhoods on individual attitudes and behavior related to crime and victimization may be also used to estimate the effects of a network of neighborhoods. The core difference consists in assessing criminogenic exposures based not only on where respondents live but based on the neighborhoods they frequent when they hang out with friends, go to school, shop, or commute to work. Exposures to each place can be weighted by the time respondents report (or are observed) to spend there or by another index representing functional ties (e.g. the number of friends they know in each place). GPS, smartphones, and tracking technologies enable collection of data that allows for weighting by the duration of exposure to a place. Alternatively, researchers may account for the time spent in traditional “nodes” such as home, work, and school as captured through activity logs (Basta et al. 2010). To account for individuals' exposures to multiple non-nested places, multiple-membership models may constitute a valuable strategy (Browne et al. 2001).

Related modeling strategies include the use of network lagged variables in hierarchical linear models. This would be similar to the use of spatial lag variables in multilevel analyses

(see Crowder and South 2011; Sampson et al. 1999) but instead of geographic proximity it would model the lag as a function of existing network ties. For different examples of modeling social and spatial networks we direct the reader to Entwisle and colleagues (2007) and Larsen and colleagues (2012).

Conclusions and directions for the future

In this article, we surveyed classic and recent studies on neighborhood effects and on the spatial stratification of poverty and urban crime. We argue that for a more complete understanding of the impact of neighborhoods and poverty on crime, sociological research would benefit from expanding the analytical focus from the residential neighborhoods to the network of neighborhoods (residential and non-residential) that individuals use during the course of their routine daily activity.

The reemergence of scholarship on activity spaces offers much promise for studies of non-residential contexts and crime. These non-residential contexts may add variation in criminogenic exposure, which would in turn influence their offending behavior (Wikström et al. 2010) and victimization risk. We proposed that non-residential exposures may be thought of as a part of a "*network of neighborhood exposures*" that includes the neighborhood contexts of the workplace, school, friends' homes, recreation activities, or wherever individuals tend to spend their time on a routine basis.

Our approach is also related to insights on the importance of inter-neighborhood connections over large geographic distances directly or indirectly implied in studies of residential mobility (Sampson 2012), extra-local organizational connections and involvement (Sampson and Graif 2009a, 2009b; Slocum et al. 2013), daily commuting distances (Zenk et al. 2011), and spatial mismatch (Holzer 1991; Kain 1968). We suggest that the criminogenic role of chronic unemployment resulting from the spatial mismatch between the location of jobs and the location of housing may be in part due to the absence of positive externalities of inter-neighborhood connections that may be forged through daily mobility across the urban landscape. We believe that our collective understanding of the causal relationship between neighborhood poverty, inter-neighborhood networks and crime will be greatly advanced by creative designs applied to studies of the recent Great Recession and economic decline more generally. More research is needed on how changes to activity spaces due to plant closures shape neighborhoods and crime and what happens when communities become disconnected as a result of economic restructuring.

Our principal purpose was to highlight the importance of studying how neighborhoods are related across space for advancing our collective understanding of macro-level patterns of neighborhood crime as well as individual attitudes and behavior. However, the study of inter-neighborhood connectivity is important for our understanding of *urban stratification across space* above and beyond crime. For instance, Krivo and colleagues (2013), using the Los Angeles Families and Neighborhoods Survey (L.A. FANS) data, found that social inequality is reproduced through daily activities. That is, people living in socioeconomically advantaged neighborhoods similarly tend to conduct activities in (i.e. work, recreation, shopping, dining) neighborhoods that *are non-overlapping* with those in which

disadvantaged populations conduct activities. Individuals from disadvantaged areas rarely enter non-disadvantaged parts of the city.

The comprehensive overview of the state of the field in the last decade and the discussion of the historical and theoretical context of the scholarship on urban poverty, neighborhoods, and crime left little room for addressing other important and recurrent issues in the field such as selection bias, ecological fallacy, and neighborhood change. We recommend several excellent reviews for more detailed discussions on these (Kim et al. 2013; Kirk and Laub 2010; Kubrin and Weitzer 2003; Matthews and Yang 2013; Pratt and Cullen 2005; Sampson et al. 2002). We differ from previous reviews in our focus on a network approach to understanding neighborhood exposures. We call for new and creative research designs and analytical approaches to understanding urban crime that transcend the typical focus on the neighborhood of residence to include a focus on the broader context of routine activities. We also call for advancements in research on urban poverty that investigate the salience of inter-neighborhood connections in evaluating criminogenic risk for individuals and communities.

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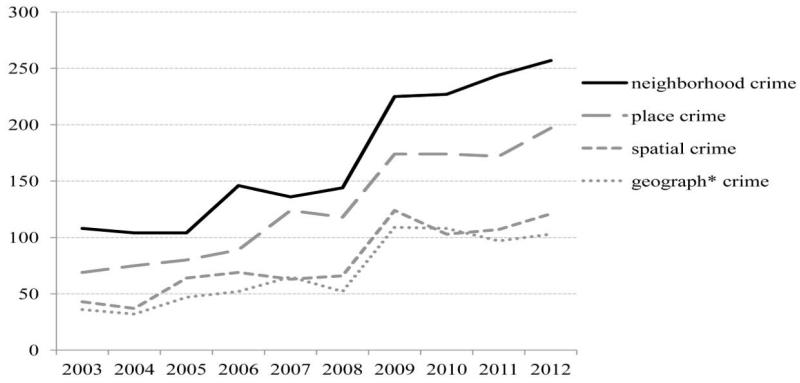

FIGURE 1.

Yearly Publication Count by Keyword Combination for the Past 10 Years Based on ISI Web of Science Search Results

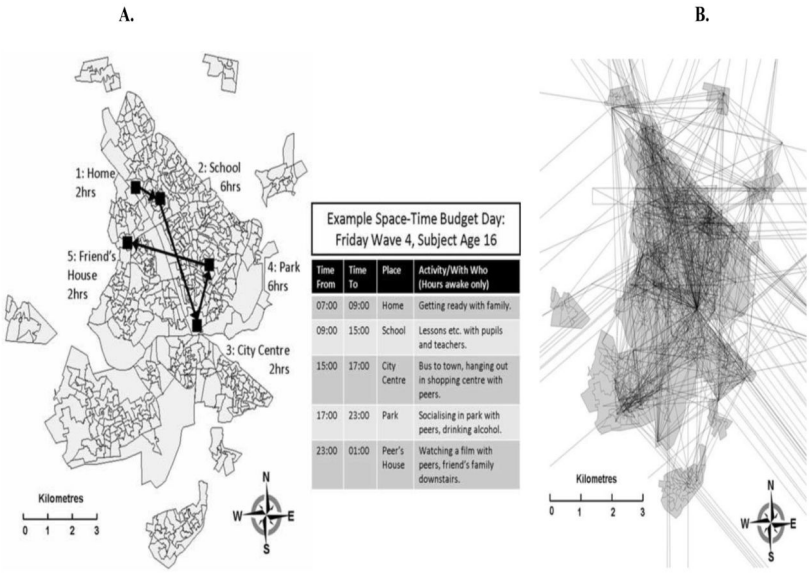

FIGURE 2.

Examples of Cross-Neighborhood Activity Spaces

Source: Adapted from Wikström et al. 2010. With kind permission from Springer.

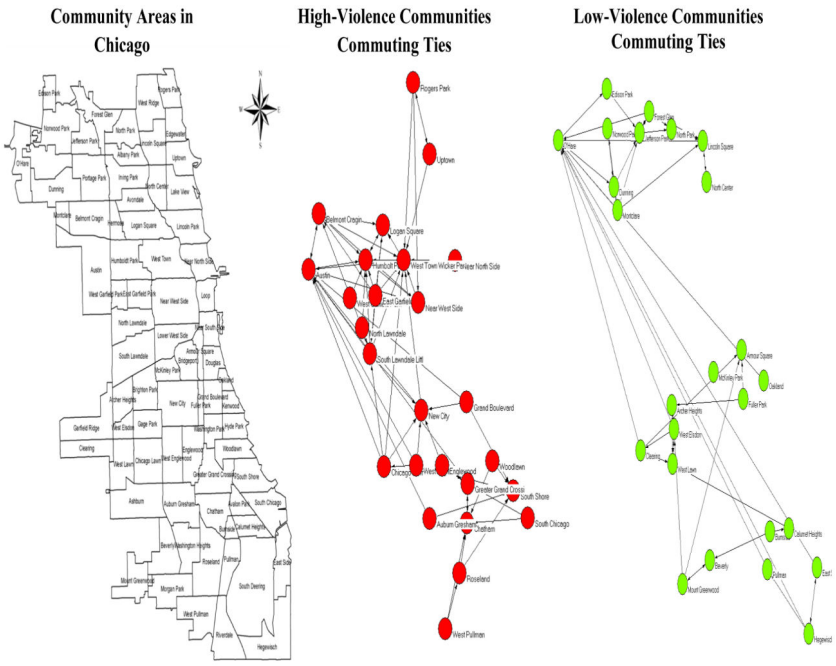

FIGURE 3.

Inter-Neighborhood Networks and Exposure to Violence

Source: Adapted from Author (2013).

TABLE 1

Examples of Neighborhood Mechanisms from Extended Spatial and Network Perspectives

Immediate neighborhood *(monadic neighborhood)* Residential neighborhood mechanisms (Sampson et al. 2002)	**Extended neighborhood *(dyadic neighborhood)* Features of surrounding areas**	**Network of Neighborhoods (*polyadic neighborhoods*) Features of neighborhoods on residents' routine activity routes**
1. Social ties/interaction	Density of friendship and kin groups in nearby areas may compensate for lack of interaction within focal neighborhood.	Gang presence on residents' route to school/work may undermine the supervising role of local primary groups in the focal neighborhood
2. Norms and Collective Efficacy	Collective efficacy in nearby neighborhoods may act as a buffer against crime in focal neighborhood; A single crime hotspot nearby may spillover and undermine the role of CE in focal neighborhood	When high numbers commute between two distant neighborhoods, crime control strategies may spill over as well
3. Institutional Resources	Density of certain types of organizations, social activities, recreational centers, family wellbeing support centers in nearby areas may deter crime and compensate for institutional isolation within a focal neighborhood	Accessible organizations, youth training family and support centers in walking proximity or *en route* to work for many residents, etc may compensate for low density of institutions within neighborhood or surroundings
4. Routine Activities (land use and daily routine activities)	The balance of residential and commercial land use in the surrounding area of a focal neighborhood, the nearby density of transportation nodes may shape local interaction patterns between local youth and transient population groups	Daily routine activity routes may enable targeting of the neighborhood by outside offenders or the targeting of outside areas by local offenders

TABLE 2

Selected Macro-level Applications of a Network of Neighborhoods Approach

Author(s)	Measurement		Levels of Analysis	Data	Type of Analyses	Area/Question
	Nodes	Ties				
Gould (1991)	Neighborhoods (“Arrondissement”)– administratively defined geographic divisions in Paris	Enlistment in the same military units by residents of different neighborhoods	Macro-level nodal (neighborhoods) and dyadic (ties between neighborhoods)	Archival records - battalion size, deaths; Administrative data	GIS mapping and mixed nodal and dyadic network modeling. Network and spatial lag regression models	What predicts neighborhood armed resistance and similarity between neighborhoods in armed resistance
Papachristos et al. (2013)	Gang turf "spaces" Boston and Chicago	Fatal and non-fatal violence between gangs	Macro-level dyadic (ties between gang "turf" areas)	Archival - records of gang violence; Census data	GIS mapping and network (dyadic and structural) analysis-- exponential random graph models (ERGM)	How spatial proximity and group processes affect violence between gangs
Radil et al. (2010)	"Spatialized" gang territories in Hollenbeck area of Los Angeles	Inter-gang violence and rivalries (surveys of LAPD and gang members)	Macro-level dyadic (ties between rival gang "turfs")	Archival records of gang violence; surveys of informants	GIS mapping and network analysis – structural equivalence models (CONCOR)	How violence and rivalry between gang "turfs" are related to gangs’ geographic location relative to each other
Sampson (2012)	Chicago community areas	Political "mover and shaker" nominations	Macro-level dyadic (ties between communities)	Surveys, Census and administrative data	GIS mapping and network modeling	How inter-community networks are related to the distribution of resources across communities
Schaefer (2012)	Census tracts in Maricopa County, Arizona (including Phoenix and 7 other large cities)	Juvenile co-offending between residents of different neighborhoods	Macro-level – dyadic (ties between tracts)	Archival - court records; Census data	GIS mapping and network (dyadic and structural) analyses-- (ERGM)	How inter-neighborhood social similarities and geographic proximity influence co-offending relationships