Moving Beyond Neighborhood: Activity Spaces and Ecological Networks As Contexts for Youth Development

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Abstract

Many scholars, policy analysts, and practitioners agree that neighborhoods are important contexts for urban youth. Yet, despite decades of research, our knowledge of why and how neighborhoods influence the day-to-day lives of youth is still emerging. Theories about neighborhood effects largely assume that neighborhoods operate to influence youth through exposure-based mechanisms. Extant theoretical approaches, however, have neglected the processes by which neighborhood socioeconomic contexts influence the routine spatial exposures—or *activity spaces*—of urban residents. In this article, we argue that exposure to organizations, institutions, and other settings that characterize individual activity spaces is a key mechanism through which neighborhoods influence youth outcomes. Moreover, we hypothesize that aggregate patterns of shared local exposure—captured by the concept of *ecological networks*—are influenced by neighborhood socioeconomic characteristics and are independently consequential for neighborhood youth. Neighborhoods in which residents intersect in space more extensively as a result of routine conventional activities will exhibit higher levels of social capital relevant to youth well-being, including (1) familiarity, (2) beneficial (weak) social ties, (3) trust, (4) shared expectations for pro-social youth behavior (collective efficacy), and (5) the capacity for consistent monitoring of public space. We then consider the implications of ecological networks for understanding the complexities of contextual exposure. We specifically discuss the role of embeddedness in *ecological communities*—that is, clusters of actors and locations that intersect at higher rates—for understanding contextual influences that are inadequately captured by geographically defined neighborhoods. We conclude with an overview of new approaches to data collection that incorporate insights from an activity-space and ecological-network perspective on neighborhood and contextual influences on youth. Our approach offers (1) a new theoretical approach to understanding the links between neighborhood socioeconomic characteristics and youth-relevant dimensions of neighborhood social capital; (2) a basis for conceptualizing contextual influences that vary within, or extend beyond, traditionally understood geographic neighborhoods; and (3) a suite of methodological tools and resources to address the mechanisms of contextual influence more precisely. Research into the causes and consequences of urban neighborhood routine activity structures will illuminate the social processes accounting for compromised youth outcomes in disadvantaged neighborhoods and enhance the capacity for effective youth-oriented interventions.

Introduction

The image of urban children growing up in economically deprived neighborhoods has spurred more than two centuries of reform and intervention aimed at ameliorating conditions thought to be harmful to youth. Alongside these initiatives, social scientists, policymakers, and health researchers have been engaged in a longstanding project to illuminate the mechanisms through which residential environments shape developmental outcomes (Elliott et al., 1996; Leventhal and Brooks-Gunn, 2000). These efforts have yielded important advances in uncovering the processes that account for variation across urban contexts in the experiences of youth (Sampson, Morenoff, and Gannon-Rowley, 2002).

Despite the substantial promise of neighborhood research, the field has been hampered by a lack of theoretical and empirical attention to the fundamental mechanism implied in most neighborhood theory—exposure. Theories of neighborhood effects predominantly posit that the causal influence of environments operates through exposure to neighborhood processes relevant to development. Yet, with few exceptions, conventional approaches to neighborhood effects do not theorize the individual-level spatial-exposure process or the collective implications of exposure patterns for neighborhood outcomes. Instead, residential location in a geographically defined neighborhood is assumed to lead to equivalent exposures across residents. The neglect of exposures has deflected attention away from the person-environment dynamics that actually channel contextual influences (Wikström et al., 2012).

In this article, we first describe a theoretical approach to neighborhood-based spatial exposures that elucidates the link between features of neighborhood disadvantage and social processes thought to influence the health and well-being of youth. We specifically argue that residence in a socioeconomically disadvantaged neighborhood shapes characteristics of individual-level *activity spaces*—that is, the set of locations and settings to which residents are regularly exposed. Individuals who reside in disadvantaged neighborhoods are less likely to have access to high-quality local institutions, organizations, and amenities, with direct implications for residents, in general, including youth. These deficits are compounded by the implications of neighborhood influences on activity spaces for the likelihood that residents share routine exposures. We hypothesize that the collective structure of shared activity-space exposures—captured by the concept of an *ecological* (or *eco-*) *network*—helps explain the link between key aspects of neighborhood disadvantage—particularly concentrated poverty and racial segregation—and a variety of dimensions of neighborhood social capital relevant to youth development.

Eco-network structures characterized by extensive overlap in conventional routines are expected to increase neighborhood-level (1) familiarity, (2) beneficial ("weak") social ties, (3) trust, (4) shared expectations for pro-social youth behavior (collective efficacy), and (5) the capacity for consistent monitoring of public space. These dimensions of social organization, particularly the proximate effects of trust and informal social control (collective efficacy), have been identified as significant neighborhood influences on youth development (Sampson, 2012). In turn, increasingly interconnected eco-network structures

are expected to confer benefits to entire neighborhoods as norms and expectations for the socialization and supervision of youth are spread and reinforced through repeated interactions of actors and neighborhood-based settings. To date, however, extant neighborhood theory has neglected the spatial-exposure mechanisms that collectively account for neighborhood socioeconomic influences on critical social processes.

Our second objective is to draw out the logic of the eco-network concept for understanding contextual influences that extend beyond the boundaries of conventionally defined geographic neighborhoods. Individual activity spaces often encompass locations that are not contained within neighborhoods of residence. Individuals may cluster in non-residential activity spaces in potentially important ways. For instance, a magnet school or employment location may draw actors from different neighborhoods together, independently influencing contextual exposures. We term clusters of activity locations and actors that intersect at higher rates *ecological communities* and argue that they are relevant sociospatial-exposure contexts in their own right that have been virtually ignored in contextual research. The extent to which ecological communities overlap with neighborhood boundaries is unknown, yet most neighborhood research implicitly assumes such sociospatial correspondence.

We conclude with an overview of new approaches to data collection and analysis, facilitating research on urban activity spaces and ecological networks. New techniques for relatively unobtrusive collection of Global Positioning System (GPS) data on daily travel paths and for ecological momentary assessment (EMA) of a variety of youth-relevant measures, such as activities, social interactions, mood, and behavior, in real time will afford new opportunities for research on neighborhood and contextual influences on youth.

Conventional Approaches to Neighborhood-Effects Research

We begin with an overview of neighborhood research, emphasizing the development of theory and empirical findings on the role that neighborhood socioeconomic characteristics play in influencing youth development and the evolving understanding of the mechanisms thought to channel these influences. Emerging from the work of early 20th century urban researchers, pioneering studies of "neighborhood effects" demonstrated the potentially significant role of social and economic characteristics of youths' residential contexts in influencing a range of outcomes, including crime and health (Faris and Dunham, 1939; Shaw and McKay, 1942). The seminal work of Shaw and McKay (1942) articulated the "social disorganization" model of crime, emphasizing the role of neighborhood-level poverty, instability in residential tenure, and ethnic/racial heterogeneity in limiting the capacity of neighborhoods to realize common goals. Mid-century critiques of this model focused on the tendency to equate social disorganization with crime itself, leaving the actual neighborhood social processes that capture disorganization incompletely conceptualized (Bursik and Grasmick, 1993).

Beginning in the mid-to-late 1970s, theoretical innovations (Kasarda and Janowitz, 1974; Kornhauser, 1978) attempted to articulate the mechanisms linking the neighborhood structural factors Shaw and McKay (1942) identified with youth outcomes. These works emphasized the consequences of neighborhood socioeconomic disadvantage for the

development of viable (dense, frequently interacting) informal social networks and participation in voluntary organizations (for example, neighborhood watch, civic groups) that could operate as conduits and reinforcements of norms and expectations directed at local youth. Kornhauser (1978) argued that poor neighborhoods concentrated individuals with limited interest in maintaining long-term residence and brought financially constrained minority and immigrant groups into proximity. In turn, residential instability and ethnic/racial heterogeneity were seen as the proximate causes of attenuated social ties as short residential tenure limited community engagement and race/ethnic distrust fragmented local networks. In this view, neighborhood poverty influenced social networks *through* instability and heterogeneity, indirectly affecting neighborhood social capacity to achieve shared goals, such as crime reduction (Bursik and Grasmick, 1993).

The reformulated social disorganization model led to a significant resurgence in research on neighborhood effects, including outcomes beyond crime and delinquency (Sampson, Morenoff, and Gannon-Rowley, 2002). Yet, concerns emerged regarding the revised model as well. First, concentrated poverty remains the single most powerful predictor of a range of negative outcomes for youth, including adolescent delinquency, dropping out of high school, and teenage childbearing (Brooks-Gunn, Duncan, and Aber, 1997a, 1997b), even after accounting for the influence of residential instability and ethnic/racial heterogeneity, indicating the need to understand the additional explanatory mechanisms linking poverty with youth well-being. Second, studies examining the effect of dense neighborhood social networks have not offered consistent evidence that strong informal social network ties exert regulatory effects on local crime rates (Bellair, 1997; Bellair and Browning, 2010; Browning, Feinberg, and Dietz, 2004; Merry, 1981; Simcha-Fagan and Schwartz, 1986; Warner and Rountree, 1997; Wilson, 1996). Moreover, evidence that informal networks explain the link between neighborhood socioeconomic disadvantage and crime and other negative outcomes has been limited (Kubrin and Weitzer, 2003; Warner and Rountree, 1997).

Equivocal findings on the role of social networks have led some researchers to shift attention away from the mediating effects of dense, frequently interacting network ties to the informal social-control processes that more directly influence youth outcomes. Sampson's *collective efficacy* theory is the most prominent disorganization-influenced model to take this tack. Indeed, collective efficacy—defined as the willingness of neighborhood residents to act on behalf of pro-social goals—has been shown to influence a wide variety of outcomes related to youth well-being, including violence (Maimon and Browning, 2010; Sampson, Raudenbush, and Earls, 1997), risky sexual behavior (Browning, Leventhal, and Brooks-Gunn, 2005, 2004), and mental health (Browning et al. 2013; Xue et al., 2005). In Sampson's approach, informal social networks are seen as contributing to collective efficacy (Morenoff, Sampson, and Raudenbush, 2001) as is the density of civic and nonprofit organizations (for example, schools, social services, libraries) (Sampson, 2012). Sampson acknowledges, however, that social networks may not always operate beneficially and may even present obstacles to the informal social control of neighborhood youth (Browning, Fein-berg, and Deitz, 2004; Pattillo-McCoy, 1999; Sampson, 2012). In addition, the simple presence of organizations does not neatly translate into neighborhood norms and

expectations supporting youth, particularly if organizational constituencies are predominantly extralocal (McRoberts, 2003). Thus, the mechanisms that link basic structural deficits to the capacity of neighborhoods to collectively influence youth outcomes remain incompletely understood.

Neighborhood research needs a richer understanding of the spatial and social mechanisms that translate neighborhood-level socioeconomic deficits, such as poverty rates and racial segregation, into the collective capacity to promote youth outcomes. What types of networks are beneficial for neighborhoods? Under what conditions do local organizations contribute to collective efficacy? How does the day-to-day spatial organization of routine activities reflect variation in neighborhood socioeconomic status and, in turn, shape the collective capacity to socialize and supervise local youth?

We present a novel approach to understanding how contexts affect youth development and healthrelated outcomes. Our "eco-network" approach to neighborhood influences on youth development emphasizes the consequences of the activity-space setting characteristics to which youth are directly exposed as well as the embeddedness of activity spaces in larger interconnected structures that consist of co-residents and their ties to activity locations. Understanding the origins of eco-network structures in socioeconomic characteristics of urban neighborhoods addresses key gaps in the current understanding of the consequences of deprivations rooted in poverty and racial segregation. Moreover, as we demonstrate in the following section, structural properties of eco-networks illuminate the critical links between neighborhood socioeconomic characteristics and proximate social processes relevant to youth, such as collective efficacy.

A Sociospatial Approach to Understanding Contextual Influence

Our theoretical approach integrates concepts from geography, social network analysis, and neighborhood theory to articulate a model of the social and spatial processes by which urban contexts influence child outcomes. We begin by tracing the recent history of the activity space concept and then describe eco-networks as applied to neighborhood research.

Conceptualizing Activity Spaces and Ecological Networks

Although theoretical developments in geography have resulted in the rapid diffusion of the concept of activity space into allied disciplines, the concept remains relatively new to neighborhood-effects research (Matthews and Yang, 2013). The time-geographic approach emerging in the 1970s was among the first systematic efforts to understand the organization of human activities in space and time (Hägerstrand, 1970). Early work in this area focused on documenting space-time patterns of human activity in unprecedented detail and understanding the implications of these patterns within the context of rapid social change (Mårtensson, 1977). Despite an ensuing period of energetic conceptual and empirical work on the role of activity spaces, for the most part, the concept did not enter into the discourse of neighborhood research.[1]

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[1]See Wikström et al.'s (2012) concept of "activity field" for a recent exception and Matthews and Yang (2013) for a review of efforts to incorporate the activity-space concept into place and health research.

Individual activity spaces comprise all the locations that individuals come into contact with as a result of their routine activities (Inagami, Cohen, and Finch, 2007; Newsome, Walcott, and Smith, 1998; Schönfelder and Axhausen, 2003, 2002). A given activity space—generated by a typical daily travel path over a period of time—may be usefully characterized by a series of spatially bounded *settings* that serve as stages for action and interaction. Settings vary in the level of structure they exhibit (whether the setting is characterized by predictable, conventional activities, behavioral expectations, and monitoring) and the extent to which their boundaries are fixed (for example, schools versus hang-out locations). *Situations* refer to the immediate social and physical environment (objects, people, events) of a setting at a particular point in time (Tseng and Seidman, 2007). We use the term "contexts" more generically when referring to any analytically delimited aspect of surrounding conditions. In this sense, settings and situations are instances of contexts that are delimited by space and space-time, respectively.

At the aggregate level, the macrostructure of interconnection between actors and settings can be usefully conceived as an eco-network that links people and activity-space settings.[2] Neighborhood residents who share an activity setting may be understood as "tied" within the ecological network. Shared routine activity locations do not necessarily imply—and in most cases will not lead to— intimate social interaction (for example, close friendship). On the other hand, eco-networks capture the structural conditions necessary for social interactions to occur (Gehl, 2011). Neighborhood residents who do not share routine activity locations are unlikely to become familiar with one another or develop neighborhood-based social ties, trust, and a sense of shared expectations for public space use within the neighborhood (see Activity-Space and Ecological-Network Effects on Youth Development later in the article for a more detailed discussion of the implications of ecological-network characteristics).

Exhibits 1 and 2 present visual representations of two eco-networks based on data from youth ages 11 to 17 residing in a low-income (exhibit 1) and high-income (exhibit 2) census tract in a large urban metropolitan area. Key activity settings are represented by squares with labels affixed to more central locations (for example, school, shopping mall). Youth are represented in the exhibit by either circles (in the high-income tract) or triangles (in the low-income tract). The shapes representing the individuals are weighted by levels of "network centrality," or the extent to which they are attached to settings that are frequented by other adolescents (Faust, 1997). (Settings are weighted by the extent to which their participating members frequent other settings.) In both exhibits, actors and settings are not geographically situated (to protect privacy).

A cursory visual inspection indicates that youth in the low-income tract report fewer activity locations than those in the high-income tract. The exhibits also reveal potentially interesting differences in the structure of routine activity intersection across tracts, however. It is not surprising that schools are relatively central locations for both tracts, although the community center is most central for the low-income tract in contrast to a high school for

[2]In network terminology, eco-networks are a specific form of "affiliation," or two-mode network (see Borgatti and Everett, 1997; Breiger, 1974). We use the term "structure" to describe both the organization of specific settings at the micro level and the structure of interconnection between actors and locations at the neighborhood eco-network level.

the high-income neighborhood. Indeed, youth in the low-income tract reported attending eleven different schools versus five for the high-income tract (with a larger sample of youth in the latter). Schools in the high-income tract thus play a more significant role in linking resident youth in the ecological network. In addition, a higher proportion of youth in the low-income tract are socially segregated within the larger neighborhood eco-network, as they are not linked to co-residents through shared activity locations. Although these data are presented for illustrative purposes only, they show that constructing eco-networks—even those based on relatively few reported activity locations—offers rich data on the structure of routine activity intersection characterizing urban neighborhoods, with potentially important implications for other aspects of social organization relevant to youth well-being. The differences across tract income level also suggest the importance of neighborhood socioeconomic characteristics in shaping key features of individual activity spaces and resulting eco-network structures.[3]

In the next section we elaborate theoretical relationships among neighborhood socioeconomic characteristics, individual-level activity spaces, resulting eco-network structural characteristics, and youth-relevant neighborhood social processes. We begin by examining the effects of neighborhood socioeconomic characteristics (for example, poverty, racial segregation) on the types of settings likely to characterize youth activity spaces (for example, organizations, institutions) and the level of structure (organized, predictable activities and behavioral expectations) activity-space settings will exhibit. We then consider the implications of neighborhood socioeconomic influences on activity spaces for the formation and macrostructural features of eco-networks such as density, centralization, clustering, and structural embeddedness and the consequences they bear for social processes that are relevant to youth developmental outcomes. We then describe the implications of activity-space and eco-network structural characteristics for child and adolescent developmental outcomes.

Determinants of Activity-Space and Ecological-Network Characteristics

Neighborhood theory has not effectively theorized the consequences of variation in socioeconomic disadvantage for the actual sociospatial exposures experienced by urban residents. We argue that spatial exposure processes are central to understanding the mechanisms through which neighborhoods influence youth wellbeing.

Neighborhood Influences on Activity-Space Characteristics—A host of factors clearly shape the activity spaces of urban residents. Individuals—particularly adults— exhibit agency in their choice of activity locations. Nevertheless, activity-space options are also subject to constraints based on location of home residence (dependent on, for example, financial resources, market conditions, and political decisions regarding housing), work (dependent on, for example, human capital, available opportunities for employment, and employer bias), family obligations, and the ability to access desired locations, both spatially

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[3]Like Bronfenbrenner's (1979) Ecological Systems Theory, the ecological-network approach views individuals as embedded in multiple, potentially relevant developmental contexts. A key innovation of the eco-network model, however, is an emphasis on the network of ties between actors and settings characterizing a collectivity as a whole (for example, a neighborhood or ecological community, as described in the following section) and the influence of these larger structures of interconnection for youth outcomes.

(Hägerstrand, 1970; Miller, 1991) and socially (Lewis, Emerson, and Klineberg, 2011; Pager and Shepherd, 2008).

Residential neighborhoods—which comprise the geographic area in which a home residence is located—are critically important determinants of activity-space characteristics. Residence in an economically disadvantaged area,[4] for instance, is associated with more limited access to high-quality organizations and amenities. For instance, Wilson (1996, 1987) argued that high-poverty contexts tend to be characterized by population decline and "deinstitutionalization"—that is, the flight of businesses, institutions, and other organizations typically present in urban neighborhoods. Small more recently argued that this process characterizes racially segregated African-American neighborhoods specifically (Small and McDermott, 2006), suggesting these neighborhoods are likely to experience particularly acute organizational deficits. Even low-income neighborhoods that exhibit relatively high levels of organizational density, however, may be characterized by compromised organizational quality and limited diversity, potentially contributing to low levels of organizational participation among neighborhood residents (Gardner and Brooks-Gunn, 2009). Indeed, extant research on businesses (for example, grocery stores), schools, social service organizations, and other organizations in low-income and racially segregated neighborhoods strongly supports the claim that high-quality and diverse local organizational options are limited in these neighborhoods (Babey, Hastert, and Brown, 2007; Connell and Halpern-Felsher, 1997; Furstenberg et al., 1999; Rankin and Quane, 2002; Zenk et al., 2005). Associated lack of employment opportunities may also send residents outside their neighborhoods to find work—often substantial distances away (Allard and Danziger, 2002; Ihlanfeldt, 1999).

Consistent with research on organizations, empirical evidence on the conditions and distribution of amenities, such as high-quality parks and recreational facilities, in low-income and racially segregated neighborhoods is equally disconcerting (Babey, Hastert, and Brown, 2007; Wolch, Wilson, and Fehrenbach, 2005). Satisfaction with the quality and maintenance of such spaces (parks in particular) is consistent in the literature (Scarborough et al., 2010; Wyant, 2008), suggesting that the availability of appealing informal amenities in low-income neighborhoods is quite limited.

These conditions have significant implications for the activity spaces of residents of economically disadvantaged and segregated neighborhoods. We expect these spaces to be characterized by fewer nonhome (or nonprivate residence) settings overall and fewer structured settings. As noted previously, by structured settings, we mean those characterized by routine participation in purposive, conventional activities, such as schools, youth-oriented organizations, places of worship, and businesses. Structured settings typically organize activities by providing explicit ends for action, norms for participating in activities,

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[4]Our focus on the neighborhood-level socioeconomic determinants of activity-space characteristics emphasizes economic disadvantage and racial segregation as major influences on urban activity spaces. Other conditions, however, including those highlighted in classic disorganization models (Shaw and McKay, 1942) may also be relevant. Ethnic and racial heterogeneity, for instance, may lead residents to avoid particular spaces, organizations, and institutions associated with outgroups (Putnam, 2007), resulting in racially and ethnically circumscribed activity spaces (Merry, 1981). Residentially unstable neighborhoods may find it harder to support businesses and institutions when faced with highly transient populations.

supervision, and resources to achieve setting goals. Unstructured settings, by contrast, offer no defined, predictable, or normatively regulated course of action (Osgood, Anderson, and Shaffer, 2005). Evidence about the prevalence of structured settings within the activity spaces of disadvantaged neighborhood residences is quite limited. Most research has focused on time-use and supervision patterns by household socioeconomic status, with some research finding that children from lower income families spend more time in unstructured activities—without systematic reference to the location of settings (for example, Lareau, 2011). Others have found that some residents of low-income neighborhoods respond to challenges in neighborhood environments by relying on in-home supervision and limiting exposure to neighborhood-based settings (Furstenberg et al., 1999). Both findings are consistent with the notion that structured settings beyond the home are more limited in disadvantaged environments, but systematic efforts to simultaneously track youth spatial exposures and the level of structure characterizing their activity settings remain rare (Wikström et al., 2012).

We would also expect that a lack of locally available, high-quality organizations and institutions would lead to larger average distances between home locations and activity-space settings. Some studies found support for these expectations. For instance, Sastry, Pebley, and Zonta (2002) found that, by comparison with Whites, racial and ethnic minority residents of Los Angeles (who were far more likely to reside in a socioeconomically disadvantaged neighborhood) traveled significantly farther to shop for groceries. African-American residents traveled farther to church, and Latinos reported longer distances between home and healthcare locations (although distance to work locations did not favor Whites).

In short, organizational deficits in disadvantaged neighborhoods limit access to high-quality local destinations, with important implications for the activity spaces of urban residents.

Neighborhood Sources of Eco-Network Structure—We expect that the socioeconomic characteristics of neighborhoods will have implications for the structure of eco-networks. For instance, to the extent that residents of economically disadvantaged or racially segregated neighborhoods report fewer activity locations overall, we might expect that eco-networks within these areas would be marked by lower levels of *density*—that is, a lower likelihood of two randomly selected residents sharing a given activity location. In addition, disadvantaged neighborhoods characterized by poor-quality schools may lead residents with children to opt out of their neighborhood school to seek better educational opportunities elsewhere (Cullen, Jacob, and Levitt, 2005). In turn, local neighborhood schools are less likely to serve as an institutional hub or social anchor for the neighborhood as a whole. Judgments about other local institutions may also lead residents to seek alternatives outside their residential neighborhood (Furstenberg et al., 1999). Thus, lower levels of *centralization* around highly popular locations may also characterize disadvantaged communities. We might also expect that subsets of residents within the neighborhood who are spatially proximate or share a need or affinity for certain types of amenities or locations might exhibit *clustering*—or a tendency to form multiple, densely connected subgroups. Such clustering, however, may be less likely to occur when amenities and commerce are not distributed across the space of a neighborhood or the diversity of available options is limited

(Jacobs, 1961). Finally, two randomly selected residents of disadvantaged, organizationally compromised neighborhoods are less likely to be linked through multiple locations—or to exhibit *structural embeddedness* (for example, encountering each other not only at the grocery store but also at the school and the local gym). Extensive overlap of activity locations among residents across a wider variety of settings is likely to decrease the level of fragmentation within eco-networks.

Residence in socioeconomically disadvantaged neighborhoods may have implications for structural properties of eco-networks beyond those considered here. Moreover, the structure of eco-networks may be generated out of colocation at less structured settings, such as street corners, public spaces on the periphery of schools, or poorly supervised parks, particularly in locales where organizational density is low. To the extent that segregated, low-income neighborhoods are characterized by fewer high-quality organizations, mutual ties to locations within such neighborhoods are more likely to involve less structured settings, with implications for the consequences of eco-network structure—a point to which we return later in the article.

In summary, we argue that neighborhood socioeconomic variation—particularly concentrated poverty and racial/ethnic segregation—influences the extent to which residents' routine, conventional activities intersect and that these patterns of intersection (structural properties of eco-networks) are linked with dimensions of neighborhood social organization that are important for youth development. Using the tools of network analysis, we can characterize relevant eco-network structures formally—for example, levels of density, centralization, clustering, and structural embeddedness—allowing for a high degree of analytic precision in linking eco-network features with neighborhood social processes and outcomes relevant to the well-being of youth.

Activity-Space and Ecological-Network Effects on Youth Development

Drawing on insights from sociological approaches to neighborhood effects, we describe expectations for the effect of activity-space exposures and eco-networks on youth developmental outcomes. We move from the implications of direct setting exposures to a discussion of the ways in which qualities of eco-networks contribute to neighborhood social processes relevant to youth development, including familiarity and trust, social ties, collective efficacy, and patterns of public space use. Identifying properties of eco-networks that are consequential for key neighborhood social processes advances the understanding of the mechanisms through which residents' activity patterns collectively influ-ence adolescents' health and developmental outcomes.

Activity Space-Setting Characteristics and Youth Development—Attending to the characteristics of adolescents' routine activity spaces becomes ever more important for understanding developmental outcomes as the frequency and intensity of interactions within and beyond the home neighborhood context increase during this life-course stage. As we noted earlier, settings vary in the level of structure they exhibit. Settings marked by routine, organized, purposive activities; enforceable norms; supervision; and the resources to support these social processes provide potentially significant socialization contexts for youth (Tseng

and Seidman, 2007). Some settings are explicitly directed toward advancing youth developmental needs, such as schools and youth services organizations. Although they vary (potentially dramatically) in quality (Bryk et al., 2010), the benefits of school participation over nonparticipation are substantial (Downey, Von Hippel, and Hughes, 2008).

Extant research on the effects of youth participation in after-school organized activities suggests they have important positive implications for development. Youth organizations (for example, Boys and Girls Clubs, YMCA, YWCA) protect youth from social hazards and stressors (for example, disorder) rooted in local environments, and they promote positive outcomes through direct participation in structured extracurricular activities. Highlighting the efficacy of organizational participation in promoting youth well-being, involvement in after-school programs or extracurricular activities is negatively associated with depressive symptomology and weak self-concept and positively associated with educational expectations and commitment among youth (Gardner, Browning, and Brooks-Gunn, 2012; Rankin and Quane, 2002). Several other studies attest to the positive effects of individual participation in after-school and extracurricular activities on a variety of adolescent developmental outcomes (for reviews, see Bohnert, Kane, and Garber, 2008; Durlak, Weissberg, and Pachan, 2010).

By contrast, unstructured, unsupervised socializing with peers is a major situational predictor of problem behavior (Maimon and Browning, 2010; Osgood et al., 1996). Osgood et al.'s (1996) formulation of routine activities theory proposes that spending large amounts of time in unstructured activities with peers in the absence of adults in supervisory roles places adolescents at an increased risk of engaging in delinquency and other problem behaviors. Indeed, unstructured socializing has been found to explain significant proportions of basic demographic disparities in delinquency based on age, sex, and race (Osgood, Anderson, and Shaffer, 2005).

Eco-Networks and Social Organizational Outcomes—Although structured and supervised activities likely promote healthy development among their participants, widespread participation in such activities confers benefits to whole neighborhoods. For instance, residence in neighborhoods with higher concentrations of organizations that serve young people and adults is negatively associated with youths' aggressive behavior (Molnar et al., 2008). Wider variety of youth-oriented services in neighborhoods has been found to be negatively associated with individual exposure to violence among adolescents (Gardner and Brooks-Gunn, 2009). Strong institutional presence and adult participation in community-based organizations in neighborhoods may also promote the well-being of youthful nonparticipants. For instance, Mason, Schmidt, and Mennis (2012) found residential proximity to religious institutions is negatively associated with substance use among a sample of urban youth, after controlling for individual religiosity. These studies suggest that strong institutional presence within neighborhoods has "spillover" effects that promote youth development, even for nonparticipants.

We argue that the collective benefits of participation in organized activities and strong organizational presence in neighborhoods are in large part because of their effect on structuring neighborhood-based eco-networks. Varieties of structured activities and

organizations within neighborhoods may lead to neighborhood-based eco-networks with beneficial structural characteristics, such as high density levels, centralization, clustering, and structural embeddedness. In turn, residents' overlap in activity settings within eco-networks will lead to repeated encounters (among youth and adults), promoting public familiarity and trust (Curley, 2010) and, potentially, beneficial organizationally based social ties. Based on his analysis of parents' interactions in childcare centers, Small (2009) argued that even quite weak organizationally based ties (acquaintances or more fleeting interactions) may yield important benefits and engender a sense of trust. In turn, although discrete settings may provide a number of direct benefits for individual youth, we argue that interconnections between residents and such settings within larger eco-networks is the principal mechanism that generates trust and shared expectations for action on behalf of the collective socialization of neighborhood youth as a whole.

We expect the process of shared, routine exposure to structured settings as captured by properties of eco-networks to promote public familiarity and trust and, in turn, to cumulatively produce and reinforce generalized, pro-social norms that become effective beyond the confines of any given setting. Using data from the Los Angeles Family and Neighborhood Survey (L.A.FANS), Browning, Soller, and Jackson (2012) found associations between the extent of overlap in routine activity locations within eco-networks —as measured by clustering and centralization—and levels of trust, network exchange, intergenerational closure (ties between adults and children in the neighborhood), and collective efficacy. Thus, consistent with expectations, structural features of neighborhood-based eco-networks independently predict neighborhood social processes that are linked to youth development.

Eco-networks have consequences for the use of public space, including streets and other outdoor areas as well. Overlapping conventional routine activities require travel to and from shared locations. As Jacobs (1961) forcefully argued, dense patterns of shared connection to locations made possible through diverse and spatially distributed activity-setting opportunities result in active urban streets. Residents who occupy neighborhood streets in the process of engaging in conventional routine activities (for example, errand running) over the course of the day offer a consistent source of street monitoring or "eyes on the street." In Jacobs' view, however, streets that are dominated by "strangers" will be less effectively monitored. By contrast, street activity generated by those engaged in routine activities—who have established a basic sense of familiarity and a "web of public trust" based on consistent exposure—will provide more robust street monitoring (Browning and Jackson, 2013) and spread norms and expectations for public behavior through larger swaths of neighborhood public space. Eco-networks in which households share many routine activity locations (for example, high structural embeddedness)—are likely to be particularly important in setting the conditions for active public spaces that are accompanied by monitoring rooted in familiarity and public trust. The prevalence of dyads linked routinely through conventional activities at multiple neighborhood-based locations generates consistent (and familiar) street activity to and from these locations.[5] At the aggregate level, then, structural embeddedness is likely to be associated with the on-the-ground informal social-control capacity that Jacobs' (1961) seminal account persuasively emphasized.

The "Content" of Ecological Networks—We highlight the benefits of eco-network ties rooted in structured settings that organize activities and interactions. In their absence, eco-networks connected through settings characterized by unstructured activity may emerge —particularly for youth. As noted earlier, exposure to unstructured socializing is one of the strongest predictors of delinquent and other risk behavior among adolescents (Osgood, Anderson, and Shaffer, 2005). When the settings in which unstructured socializing occurs are linked into larger eco-networks characterized by settings with similarly low levels of structure, neighborhoods may experience substantially increased opportunities for participation in problem behavior among youth. Similarly, adult ties through unstructured settings are less likely to generate positive social organization benefits. For instance, residents tied primarily through shared, informal street settings associated with residential proximity may produce highly localized familiarity and trust, but these benefits may not extend beyond the immediate microneighborhood. The concatenation of highly local patterns of social organization or "territoriality" (Taylor, 1988) may result in "patchier," more spatially insular social organization, producing fewer benefits for youth. Suttles (1968) argued that, in highly disadvantaged urban contexts, residentially localized patterns of interaction may be employed strategically to generate direct social ties and information about potential threats and resources in the immediate environment; however, the familiarity generated by these patterns is less easily translated into collective trust and shared normative orientations at the larger neighborhood level (see also Granovetter, 1973).

In summary, our theoretical model emphasizes the mediating role of ecological-network factors in the link between neighborhood socioeconomic characteristics and social organizational dimensions of neighborhoods relevant to youth. In neighborhoods characterized by dense, clustered, centralized, and structurally embedded eco-networks, with actors who are linked predominantly through structured settings, we anticipate higher levels of familiarity; beneficial, organizationally based social ties that extend beyond the immediate residential environment (for example, block); trust; and collective efficacy with respect to the socialization and supervision of youth. We also expect these eco-network structures to generate more extensive street activity, contributing to "eyes on the street" and more effective informal social control—particularly when activity locations are neighborhood based and dispersed.

Finally, social network tools allow for characterization of both overall network structures and the network positions of specific actors and settings in the case of eco-networks. As noted earlier, unstructured settings linked to other such settings through the activity patterns of local youth are likely to be more problematic as exposures contexts. By contrast, unstructured settings in eco-networks characterized by a predominance of structured settings are likely to be less problematic for youth because of the positive influence or "spillover" effects of the structured settings to which they are tied. Maimon and Browning (2010), for instance, found that neighborhood advantage significantly attenuates the positive effect of

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[5]Jacobs (1961) emphasized the spatial distribution of conventional routine activity locations, such as businesses and other amenities, highlighting the importance of dispersing these destinations throughout neighborhood environments. Concentration of locations (for example, strip malls) leads to larger interstitial "gray area" spaces lacking commercial and other destinations to generate sufficient numbers of eyes on the street. The temporal distribution of activity patterns generated by local destinations is also important for the consistency of street monitoring.

unstructured socializing on violence among youth. Unstructured settings in more affluent and socially organized neighborhoods are likely to be embedded in larger structures of constraint, reducing their potentially harmful effects. In the language of social network analysis, setting effects may differ, depending not only on the features of the focal setting but also on the level of structure characterizing the settings to which they are tied; that is, their "centrality" within larger eco-networks of structured or unstructured settings.

Thus far, we have considered pathways through which neighborhood socioeconomic characteristics influence activity spaces and the associated formation of neighborhood eco-networks. In turn, we linked characteristics of eco-networks to the operation of neighborhood social processes that are relevant to youth development. Although we note the importance of eco-networks to a variety of neighborhood social processes, the ecological-network approach may be extended to address the role of contextual exposures that extend beyond, or are inadequately captured by, the boundaries of residential neighborhoods. Next, we turn to the implications of the ecological-network approach for multilevel theoretical models of context effects more generally by considering the consequences of residential and nonresidential activity-space exposures.

Limitations of Neighborhood-Bounded Approaches

Although social and spatial overlap in routine exposures among neighbors is key for developing eco-networks within residential neighborhoods, daily activities often take youth and adults well beyond the boundaries of residential neighborhoods. This observation is by no means new. Early theorists of the Chicago School of sociological thought, including Park, Burgess, and McKenzie (1925) and McKenzie (1921), highlighted the spatially embedded nature of neighborhoods. McKenzie (1921), for instance, was well aware of the partial and contingent role of neighborhoods in organizing day-to-day exposures. In his view, the Park-derived (Park, Burgess, and McKenzie, 1925) concept of "mobility" captured not only changes in residential address but also in patterns of daily travel. Writing in the early 20th century, McKenzie (1921) observed that streetcars and automobiles had extended the typical radius of activity beyond the local neighborhood, with disintegrating effects on neighborhood life. Observing increasing mobility and expanding activity radiuses, some mid-century urban planners expressed deep skepticism regarding the utility of the neighborhood concept, arguing that neighborhoods only partially captured the daily exposures characterizing a typical urban family (Isaacs, 1948).

Nevertheless, the practical application of neighborhood research over the course of the 20th century was dominated by the assumption of an autonomous and all-encompassing neighborhood unit (typically a census tract). Only recently has this model been subject to significant challenge, and empirical evidence on the actual day-to-day exposures of urban residents remains relatively scarce. Limited data from large-scale probability studies suggest adult urban residents' routine activity spaces encompass locations beyond the residential census tract. For example, findings from L.A.FANS indicate that roughly 12 percent of respondents' places of worship and 15 percent of grocery stores were located within residential census tract boundaries and 44 percent of places of worship and 63 percent of grocery stores were located within tracts contiguous to the residential tract (Sastry, Pebley,

and Zonta, 2002). The limited data that are available on the geographic dispersion of adolescents' routine activity spaces also suggest youths' activities are situated beyond tract boundaries. For instance, Basta, Richmond, and Wiebe (2010) detailed the travel routes of a sample of Philadelphia adolescents during 1 day. The study revealed that the youth spent a considerable amount time outside their home census tracts, suggesting the spatial dispersion of adolescent routine activities is more expansive than previously assumed.

The restricted scope of most neighborhood studies, coupled with increasing evidence regarding the extent of nonresidential spatial exposure among youth and adults, leads to a number of concerns about the nature of extant findings regarding context effects on youth (Cook, 2003). First, focusing on an arbitrarily limited geographic context precludes assessment of the combined effects of multiple relevant developmental contexts. A joint contextual effect may be substantially greater than the effect of any given context in isolation. Second, accounting for only a subset of youth exposures may lead to bias when estimating neighborhood effects (if omitted characteristics of unmeasured contexts are confounded with the effects of measured contexts on individual outcomes). Third, research designs and theoretical models that incorporate a limited number of contexts restrict the capacity to understand the influence of intercontext interactions on developmental outcomes (Inagami, Cohen, and Finch, 2007). For instance, the negative effect of residence in a disadvantaged neighborhood may be buffered by extra-neighborhood exposures (for example, attending a high-quality school in a more advantaged neighborhood).

Thus, by incompletely capturing actual exposures, conventional neighborhood research has likely failed to capture the "total" contextual effect by estimating biased residential neighborhood effects and obscuring the interactional dynamics of contextual exposures. In the absence of comprehensive assessment of contextual exposures, researchers may spuriously attribute outcomes to family-or individual-level factors—even when neighborhood factors are considered. These concerns highlight the need for assessing actual exposures to properly understand the nature of neighborhood and extra-neighborhood contextual influences. We specifically argue in the next section not only for assessing specific activity-space exposures within and beyond residential neighborhoods but also for understanding patterns of activity-space intersection as capturing independently influential "ecological communities."

From Neighborhoods to Ecological Communities

Recognizing the limitations of focusing exclusively on residential environment, researchers have begun to explore characteristics of nonresidential contexts to explain individual variation in health outcomes and behavior. For example, spatial dependence models consider the influence of nearby communities for individual and aggregate outcomes (Anselin, 1988), but the models typically neglect individuals' actual mobility patterns and spatial exposures (Mears and Bhati, 2006; Morenoff, Sampson, and Raudenbush, 2001). As an alternative to the focus on residential environment, activity-space approaches (Basta, Richmond, and Wiebe, 2010; Inagami, Cohen, and Finch, 2007; Miller, 1991; Nemet and Bailey, 2000) attempt to explicitly measure spatial exposures at the individual level (Kwan et al., 2008; Mason, Schmidt, and Mennis, 2012; Mennis and Mason, 2011). Relying exclusively on an

activity-space approach, however, will neglect the larger sociospatial communities in which individual exposures are embedded.

The ambiguities associated with attempts to operationalize neighborhood of residence can be addressed by conceptualizing eco-networks as extending beyond the confines of residential neighborhood boundaries. As noted previously, extant studies of neighborhood context effects on adolescent outcomes have tended to assume that measurement of residential neighborhoods effectively captures the developmentally relevant set of exposures. By contrast, we argue that activity spaces and their aggregated structure in the form of eco-networks more directly measure such exposures. Although a predefined geographic area may be characterized according to the ecological network operating within its boundaries (and this may be a valid approach, depending on the research question considered), activity-space exposures and eco-network ties will frequently extend beyond the identified neighborhood boundary. In turn, regions of larger eco-networks characterized by relatively dense internal connections (regardless of the residential propinquity of constituent actors and the distance between locations) may be termed "ecological communities." We argue that these clusters of interconnected actors and settings—which may be empirically defined through social network analytic techniques (Field et al., 2006; Frank et al., 2008)—are potentially significant units of social and spatial exposure beyond the geographic neighborhood.

Although neighborhoods and ecological (or "eco-") communities may overlap considerably, we take the degree of overlap to be an empirical question. In some instances, youth from the same residential area will exhibit overlapping activity spaces that are also contained largely within the residential boundary. We hypothesize that this scenario is less prevalent than often assumed, however. In fact, characteristics of the eco-communities of residentially proximate youth may vary considerably on the key social organizational dimensions we have thus far considered, with potentially important developmental implications. To the extent that an individual's activity-space locations place him or her in an eco-community largely outside the residential neighborhood, we may expect residential neighborhoods to be significantly less influential.

Theoretically and empirically distinguishing eco-community and neighborhood may shed light on mixed findings regarding the role of typically operationalized neighborhoods in youths' lives. Children and youth who reside in economically disadvantaged neighborhoods may nonetheless tap into resourceful communities. For example, Small (2009) found that childcare centers in high-poverty neighborhoods provided settings in which links to valuable (often weak) informal ties and organizationally brokered resources were established. In turn, mothers who participated in these organizations had increased access to other youth programs and beneficial activity settings resulting in better outcomes for their children when compared with other geographically proximate residents. Small (2009) argues that ties established through organizational affiliations are rarely a result of informed, instrumental action. Rather, such ties often occur as a byproduct of more mundane social transactions (Coleman, 1990). Thus, the origins of eco-community affiliations are unlikely to be straightforwardly determined by the purposive actions and resources of individuals (that is, a selection model of community membership). At the same time, eco-community affiliations

may be highly significant sources of contextual influence. In the absence of effective measurement of eco-networks and communities, divergent outcomes among youth who share the same neighborhood may be spuriously attributed to individual or family characteristics.

We graphically depict key differences between neighborhood eco-networks and larger community eco-networks in exhibit 3. First, Panel I displays a hypothetical neighborhood's (tract 4) ecological network. In this exhibit, circles represent youth and triangles represent activity spaces to which they are connected through routine daily activities. Only activities that take place within the geographically defined census tract boundary (demarcated by dashed lines) are displayed in Panel I. In this exhibit, actor A is isolated, given she is not linked to any activity location within the neighborhood ecological network. On the other side of the spectrum, actors B and C exhibit high levels of structural embeddedness, given they are similarly situated in the ecological network and exhibit considerable activity-space overlap (Feld, 1997). Actors D and E are far less structurally embedded than B and C, because the former share only one activity location. Finally, in Panel I, one activity location is especially central in the network and is crucial in connecting the neighborhood's ecological network.

As previously mentioned, individuals' activity spaces most likely extend beyond residential neighborhood boundaries. We hypothesize that the geographic distribution of individuals' activity spaces (including those beyond the neighborhood) and network configuration of actors and settings within larger eco-networks will reveal underlying "community structures" within more extended urban eco-networks (for example, city-level eco-networks). We illustrate the importance of examining community eco-networks in Panel II in exhibit 3. Panel II is similar to Panel I; however, it also includes individuals and activity-space settings from the adjacent neighborhoods. In addition, shapes representing individuals are grouped according to shared participation in "local communities," which are identified on the basis of high degrees of overlapping activity spaces. (Individuals are shaded according to their eco-network communities.) Note that in Panel I, actor A did not share any activity spaces with other youth from her neighborhood. She has considerable activity-space overlap with adolescents from tracts 1 and 2 on the eastern and northern borders, however. In addition, actors B, C, and E have more overlap in routine activity spaces with individuals from adjacent neighborhoods than those from their own neighborhood. In addition, while actors D and E had low structural embeddedness in Panel I, Panel II reveals they share several activities that are located in tract 3. As exhibit 3 illustrates, attending to the structure of larger eco-networks may provide insight into the extent of variable exposure to neighborhood settings and of participation in communities that extend beyond identified neighborhood boundaries.

This illustration (exhibit 3) reveals eco-communities that span the neighborhood boundary but are nevertheless composed of settings that remain spatially proximate. Actual eco-communities may be significantly more complex from the standpoint of the spatial distribution of component settings and the residential locations of constituent actors. To date, however, the ecological structure of daily routines has been largely ignored in studies of neighborhood and youth outcomes. The absence of high-quality data on activity spaces

has been a major encumbrance to research on socio-spatial exposures. The past few years, however, have brought dramatic advances in technology and resources to collect such data. We now turn to a discussion of these advances and the significant potential they offer to expand our understanding of contextual effects on youth.

New Approaches to Data Collection on Contextual Effects

The relative neglect of multicontextual influences on adolescent development in extant research is partly rooted in limitations of existing data resources. No large-scale dataset on adolescent behavioral problems and health collects high-quality data on families, residential neighborhoods, schools, and extensive social network and activity-space data over time. Although the National Longitudinal Study of Adolescent Health (AddHealth; Harris 2010) is an excellent resource to investigate peer network and school effects over time, it has limited information on neighborhood contexts and individual activity spaces. The Los Angeles Family and Neighborhood Survey (L.A.FANS) features a neighborhood-based design over two sampling waves and includes activity space data (Sastry et al., 2006). For younger respondents, however, activity-space information is limited to a few geocoded data points, such as schools, childcare providers, and churches. The L.A.FANS also contains limited information on school social processes and social network ties beyond family members. The Project on Human Development in Chicago Neighborhoods (PHDCN; Earls et al., 1995) is a highly innovative design for examining neighborhood effects. Information on social network ties is limited, however, and activity-space data are negligible.

Despite substantial investment in understanding the role of social context in the health and behavior of adolescents, limitations of existing data resources have precluded a comprehensive accounting of multicontextual influences on youth development. Future research that gathers fine-grained activity-space data will advance knowledge on the actual spatial exposures and interactional settings that youth experience and the role the exposures and setting play in shaping risk behavior and health outcomes. Moreover, dense samples of youth will capture activity-space overlap, allowing for the construction of eco-networks from Global Positioning System data collected through smartphones or map-based interfaces that are displayed on computer screens (for example, Google Maps). Large-scale data collection efforts that combine survey data with cell phone-based GPS data on the locations of activity-space settings and real-time information through ecological momentary assessment (EMA; Shiffman et al 2007) will greatly advance understanding of the causal processes underlying the association between contextual characteristics and adolescent health and development. In the remainder of this article, we describe how information on youth's routine activities may be gathered and analyzed to understand how activity spaces, eco-networks, and eco-communities affect youth development. By using GPS technology, EMA, and social network analytic techniques for analyzing affiliation networks, future research may better understand how sociospatial patterns of routine activities affect the context of youth development.

Capturing Situational Influences on Adolescent Outcomes

To date, the process by which situations unfold to influence adolescent outcomes has remained elusive. We know little about actual adolescent behavioral settings and the larger

patterns of routine activity in which they are embedded (Mason, 2010; Mason et al., 2010). Assessments of activity spaces of youth gathered through GPS technology may provide a detailed assessment of the routine spatial exposures and activities of a large sample of youth over an extended study period. By incorporating GPS-tracked spatial exposures directly into the conventional interview process, such as computer-assisted personal interviewing, or CAPI, that includes a map-based interface, youth can be prompted to report on the activities they engage in over a period of time (for example, more formal activities, such as organized sports, versus informal activities), features of the settings in which these activities occurred (including their level of structure), and the presence of peers and adults with whom they frequently interact (Wikström et al., 2012). Such methods facilitate thorough assessments of key qualities of adolescent contexts (for example, levels of parental/adult monitoring or informal social control) that influence adolescent health and development.

EMAs of youth routine activity locations can also be used to identify characteristics of adolescents' immediate social settings in real time. EMA encompasses a number of methodologies used to collect individual reports of context, behavior, and self-evaluations of mood and other health states as they occur in real-world environments. These methods have been used to study a wide range of health-related behaviors, experiences, and conditions, including poor diet, substance use, psychological stress, sexual behavior, and depression (Shiffman, 2009; Shiffman, Stone, and Hufford, 2007; Shrier, Shih, and Beardslee, 2005; Thiele, Laireiter, and Baumann, 2002; Todd et al., 2003). Researchers have used EMA methods successfully among children and adolescents (Freeman, Csikszentmihalyi, and Larson, 1986; Larson, 1989; Larson, Csikszentmihalyi, and Graef, 1980; Mermelstein et al., 2007) and low-education and low-socioeconomic status respondents (Finkelstein, Cabrera, and Hripcsak, 2000; Hufford et al., 2002). Advances in, and the increasingly availability of, GPS-enabled smartphone technology facilitate (1) EMAs of important adolescent outcomes (for example, risk behavior and mental health), (2) assessments of setting characteristics, and (3) latitude/longitude coordinates of routine activity spaces and locations of risk behavior.

EMAs capturing risk behavior, victimization, and affective states allow for direct linkage of setting characteristics to adolescent outcomes. At the same time, EMAs capturing appraisals of settings (for example, extent of adult supervision) allow for fine-grained assessments of local environments. In turn, interview-based data on the risk behavior orientations of peers allow for the investigation of the contextual nature of peer effects. For instance, such methods enable researchers to assess such questions as, "Are the effects of time spent with risk behavior-oriented peers substantially accounted for by the amount of time spent in unsupervised and unstructured behavioral settings?" and "Are peers who are more generally involved in risk behavior less likely to encourage such activity when co-present with a focal adolescent only in supervised and structured settings?" Space-time situated network data offer unprecedented characterization of the typical settings to which adolescents are exposed (beyond the home and school) and their health and developmental consequences.

Beyond capturing individual exposure to micro-contexts, GPS-based activity-space data combined with reports from youth on other regular places they go (collected through survey data) will provide an opportunity to identify communities of respondents based on activity-

location ties. Using techniques for analyzing affiliation networks comprising individuals attached indirectly through shared activity locations, geocoded activity-space data offer a detailed picture of clustering in activities among youth, thus capturing the larger subset of actors and places to which youth are connected (that is, eco-communities [Field et al., 2006; Frank et al., 2008]). Recent extensions of network methods (Borgatti and Everett, 1997; Doreian, Batagelj, and Ferligoj, 2004) for detecting cohesive subgroups to the two-mode case (in our case, actors and settings) enable researchers to cluster actors into single, nonoverlapping communities.

In turn, the effects of key characteristics of youth communities on youth outcomes can be measured using multilevel regression models of significant health and behavioral outcomes. For instance, because eco-communities are spatially bounded, qualities of eco-communities (for example, informal social control, trust) can be measured using survey responses from community residents. Multilevel regression models that incorporate survey- and EMA-based measures of eco-community characteristics as independent variables will likely provide novel insights into how exposures to activity settings beyond neighborhood environments contribute to adolescent outcomes. Individuals' positions within eco-communities may also be assessed to test the hypothesis that eco-network communities are more consequential for health and development for adolescents who are more "central" within them. Collecting data on time spent at different activity-space locations also allows for precise estimates of contextual "dosage" (Galster, 2012).

The availability of new technologies for collecting rich temporally and geographically referenced data on spatial and social exposures in combination with advances in approaches to the statistical modeling of network data offer neighborhood researchers a variety of opportunities to advance knowledge on contextual influence. The convergence of relevant data collection and methodological advances constitutes a unique opportunity and holds the potential to usher in a new generation of research on the social context of youth development (see Browning et al., 2014, for a description of a data collection effort employing new techniques for assessment of contextual influence on youth).

Discussion

We argue that the concepts of activity space and eco-networks offer unprecedented potential to address some of the major challenges that contemporary neighborhood research faces on children and youth. It can be argued that the contemporary neighborhood-effects literature faces four key challenges: (1) the need to identify the mechanisms accounting for socioeconomic influences on youth outcomes; (2) the problem of identifying the appropriate neighborhood boundary; (3) the issue of causal inference in estimating neighborhood effects; and (4) the need for high-quality, precise data on the nature of routine exposures among urban residents.

First, we argue that ecological-network processes are key mechanisms linking neighborhood socioeconomic characteristics (for example, concentrated poverty, racial/ethnic segregation) to dimensions of social organization (for example, trust, informal social control) relevant to youth well-being. We develop a novel theoretical perspective on the emergence of eco-

networks—virtually ignored in earlier research—and their role in fostering key dimensions of social organization relevant to promoting youth development. To be specific, eco-networks emerge from the patterns of spatial overlap in neighborhood and community residents' conventional routine activities (for example, grocery shopping, childcare, extracurricular activities). The patterns of eco-networks are fundamentally shaped by the availability of high-quality institutions, organizations, and amenities and, therefore, are intrinsically linked to neighborhood socioecononomic conditions. In the aggregate, more interconnected eco-networks enhance familiarity, trust, beneficial organizationally based social ties, collective efficacy, and the capacity for effective monitoring of youth. At the microlevel, organizational characteristics of activity settings (that is, setting structure) have important implications for the mental and behavioral health of youth embedded within eco-networks.

The activity-space and ecological-network approach makes possible the investigation of a number of additional research questions critical for understanding urban neighborhood problems. Some proponents of mixed-income housing, for instance, argue that benefits to low-income residents will ensue from exposures to middle-class neighbors and class-integrated local institutions.[6] An ecological-network approach to assessing the effect of a mixed-income housing development would capture actual activity-space exposures of local neighborhood residents across socioeconomic status. The structure of resulting eco-networks would allow for detailed investigation of the extent to which low- and middle-income residents actually share routine activity settings, such as schools, commerce, and other amenities, and the conditions under which socioeconomically integrated activity settings emerge. Hypotheses about the level of integration characterizing ethnically and racially heterogeneous census geographies might also be tested based on ecological-network data. Substantial variability may exist in the extent to which members of different race/ethnic groups actually share activity settings in neighborhoods that are considered "integrated," based on census measures of racial/ethnic composition.

Second, ecological-network data make possible the identification of eco-communities that may be independently relevant units of contextual influence on youth outcomes. By identifying clusters of actors and settings that share ties at higher rates, this approach empirically uncovers potentially significant contexts of shared social and spatial exposure beyond often arbitrarily defined neighborhood geographies. Beneficial communities linking youth to clusters of pro-social institutions and settings may be observed in otherwise disadvantaged urban areas—understanding how such communities emerge and the processes by which youth become exposed to them is likely to yield important information for policymakers who are interested in urban poverty and child development.

Third, although the problem of causality and selection is particularly challenging for contextual effects research, activity-space and eco-network data provide information on the key mechanism assumed in the vast majority of neighborhood-based theoretical models—exposure.[7] By building actual exposures into theoretical models and data collection efforts, activity-space and eco-network approaches provide an opportunity to capture precise

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[6]See Joseph, Chaskin, and Webber (2007) for a review of theories about the benefits of mixed-income housing.

information on the causal processes typically assumed in extant research. Although selection processes remain difficult to capture (Chaix et al., 2013), exposure data allow for estimating "treatment" effects at a level of precision that limited neighborhood-of-residence information precludes. These approaches also allow for exploiting exogenous contextual shocks. For instance, externally imposed changes to contexts may be hypothesized to have an effect on a given population under the assumption of exposure to the environmental change. Activity-space and eco-network data allow for tests of the extent of actual exposure to a potential mechanism of influence and may be particularly useful when exposures are hypothesized to operate in a "dose-response" relationship. Such analytic approaches to dealing with the problem of causality are largely unavailable with existing, large-scale data resources on urban context effects.

Fourth, as noted, despite tremendous progress in the measurement of context, only recently have the technologies for collecting precise exposure data emerged. Ongoing technological advancements in the capabilities of smartphones and other technologies for collecting real-time geo-referenced data are occurring at breakneck pace. For instance, the Adolescent Health and Development in Context study, a large-scale investigation of the activity spaces of urban adolescents, is currently under way in Columbus, Ohio (Browning et al., 2014). In this study, adolescents provide GPS locations and EMAs of activity settings (including real-time reports of socializing with friends, violence, drug use, and mood states) using smartphones over the course of a week. These data, coupled with information on community characteristics (for example, collective efficacy) and traditional self-report data obtained from surveys of parents and adolescents, will allow for an unprecedented examination of the context of adolescent development. Moreover, with the increasing availability of "big data," including volunteered geographic information (for example, Twitter, Foursquare) and other administrative resources, the capacity for rich characterization of urban spatial contexts is unprecedented.

As scholars increasingly capitalize on these revolutionary advances, we anticipate a dramatic reinvigoration of contextual effects research. In combination with new data collection technologies, the incorporation of activity-space and ecological-network concepts into contextual effects research holds the potential to substantially advance understanding of the mechanisms through which urban environments channel influence—an increasingly pressing need as the global process of urbanization accelerates.

Acknowledgments

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[7]Although exposure is the dominant mechanism advanced in neighborhood theory, other mechanisms may also operate. For instance, youth who are known to reside in a neighborhood with a reputation for gang violence may be influenced by that reputation (for example, by school officials or employers), even if a resident youth spends little or no waking time in the neighborhood.

References

Allard, Scott W.; Danziger, Sheldon. Proximity and Opportunity: How Residence and Race Affect the Employment of Welfare Recipients. Housing Policy Debate. 2002; 13(4):675–700.

Anselin, Luc. Spatial Econometrics: Methods and Models. Dordrecht, the Netherlands: Kluwer Academic Publishers; 1988.

Babey, Susan H.; Hastert, Theresa A.; Richard Brown, E. Health Policy Research Brief. Los Angeles: UCLA Center for Health Policy Research; 2007. Teens Living in Disadvantaged Neighborhoods Lack Access to Parks and Get Less Physical Activity.

Basta, Luke A.; Richmond, Therese S.; Wiebe, Douglas J. Neighborhoods, Daily Activities, and Measuring Health Risks Experienced in Urban Environments. Social Science & Medicine. 2010; 71(11):1943–1950. [PubMed: 20980088]

Bellair, Paul E. Social Interaction and Community Crime: Examining the Importance of Neighbor Networks. Criminology. 1997; 35(4):677–704.

Bellair, Paul E.; Browning, Christopher. Contemporary Disorganization Research: An Assessment and Further Test of the Systemic Model of Neighborhood Crime. Journal of Research in Crime and Delinquency. 2010; 47(4):496–521.

Bohnert, Amy M.; Kane, Peter; Garber, Judy. Organized Activity Participation and Internalizing and Externalizing Symptoms: Reciprocal Relations During Adolescence. Journal of Youth and Adolescence. 2008; 37(2):239–250.

Borgatti, Stephen P.; Everett, Martin G. Network Analysis of 2-Mode Data. Social Networks. 1997; 19(3):243–269.

Breiger, Ronald L. The Duality of Persons and Groups. Social Forces. 1974; 53(2):181–190.

Bronfenbrenner, Urie. The Ecology of Human Development: Experiments by Nature and Design. Cambridge, MA: Harvard University Press; 1979.

Brooks-Gunn, Jeanne; Duncan, Greg J.; Lawrence Aber, J., editors. Context and Consequences for Children. Vol. 1. New York: Russell Sage Foundation; 1997a. Neighborhood Poverty.

Brooks-Gunn, Jeanne; Duncan, Greg J.; Lawrence Aber, J., editors. Policy Implications in Studying Neighborhoods. Vol. 2. New York: Russell Sage Foundation; 1997b. Neighborhood Poverty.

Browning, Christopher R.; Calder, Catherine; Cooksey, Elizabeth; Kwan, Mei-Po. [accessed February 27] Adolescent Health and Development in Context. 2014. Available at http://sociology.osu.edu/browning-adolescent-health-and-development-context

Browning, Christopher R.; Feinberg, Seth L.; Dietz, Robert D. The Paradox of Social Organization: Networks, Collective Efficacy, and Violent Crime in Urban Neighborhoods. Social Forces. 2004; 83(2):503–534.

Browning, Christopher R.; Jackson, Aubrey. The Social Ecology of Public Space: Active Streets and Violent Crime in Urban Neighborhoods. Criminology. 2013; 51(4):1009–1043.

Browning, Christopher R.; Leventhal, Tama; Brooks-Gunn, Jeanne. Sexual Initiation During Early Adolescence: The Nexus of Parental and Community Control. American Sociological Review. 2005; 70(5):758–778.

Browning, Christopher R.; Leventhal, Tama; Brooks-Gunn, Jeanne. Neighborhood Context and Racial Differences in Early Adolescent Sexual Activity. Demography. 2004; 41(4):697–720. [PubMed: 15622950]

Browning, Christopher R.; Soller, Brian; Gardner, Margo; Brooks-Gunn, Jeanne. 'Feeling' Disorder As a Comparative and Contingent Process: Neighborhood Conditions and Adolescent Mental Health. Journal of Health & Social Behavior. 2013; 54:296–314. [PubMed: 24026534]

Browning, Christopher R.; Soller, Brian; Jackson, Aubrey. Advancing the Conceptualization and Measurement of Neighborhood Context Effects: Integrating Social Network and Activity Space Approaches. Conference on Local Area Processes: Models, Methods, and Measures; University of Chicago Urban Network; 2012.

Bryk, Anthony S.; Sebring, Penny Bender; Allensworth, Elaine; Luppescu, Stuart; Easton, John Q. Organizing Schools for Improvement. Chicago: University of Chicago Press; 2010.

Bursik, Robert; Grasmick, Harold. Neighborhoods and Crime: The Dimensions of Effective Community Control. New York: Lexington Books; 1993.

Chaix, Basile; Meline, Julie; Duncan, Scott; Merrien, Claire; Karusisi, Noella; Perchoux, Camille; Lewin, An-toine; Labadi, Larima; Kestens, Yan. GPS Tracking in Neighborhood and Health Studies: A Step Forward for Environmental Exposure Assessment, a Step Backward for Causal Inference? Health & Place. 2013; 21:46–51. [PubMed: 23425661]

Coleman, James S. Foundations of Social Theory. Cambridge, MA: Harvard University Press; 1990.

Connell, James P.; Halpern-Felsher, Bonnie L. How Neighborhoods Affect Educational Outcomes in Middle Childhood and Adolescence: Conceptual Issues and an Empirical Example. In: Brooks-Gunn, Jeanne; Duncan, Greg J.; Lawrence Aber, J., editors. Neighborhood Poverty. Vol. 1, Context and Consequences for Children. New York: Russell Sage Foundation; 1997. p. 174-199.

Cook, Thomas D. The Case for Studying Multiple Contexts Simultaneously. Addiction. 2003; 98(s1): 151–155. [PubMed: 12752368]

Cullen, Julie Berry; Jacob, Brian A.; Levitt, Steven D. The Impact of School Choice on Student Outcomes: An Analysis of the Chicago Public Schools. Journal of Public Economics. 2005; 89(5–6):729–760.

Curley, Alexandra M. Neighborhood Institutions, Facilities, and Public Space: A Missing Link for HOPE VI Residents' Development of Social Capital? Cityscape. 2010; 12(1):33–63.

Doreian, Patrick; Batagelj, Vladimir; Ferligoj, Anuška. Generalized Blockmodeling of Two-Mode Network Data. Social Networks. 2004; 26(1):29–53.

Downey, Douglas B.; Von Hippel, Paul T.; Hughes, Melanie. Are 'Failing' Schools Really Failing? Using Seasonal Comparison To Evaluate School Effectiveness. Sociology of Education. 2008; 81:242–270.

Durlak, Joseph A.; Weissberg, Roger P.; Pachan, Molly. A Meta-Analysis of After-School Programs That Seek To Promote Personal and Social Skills in Children and Adolescents. American Journal of Community Psychology. 2010; 45(3–4):294–309. [PubMed: 20300825]

Earls, Felton J.; Brooks-Gunn, Jeanne; Raudenbush, Stephen W.; Sampson, Robert J. Project on Human Development in Chicago Neighborhoods 1995–2002. Ann Arbor, MI: Inter-University Consortium for Political and Social Research [distributor]; 1995. [Computer file]. ICPSR13714-v1

Elliott, Delbert S.; Wilson, William Julius; Huizinga, David; Sampson, Robert J.; Elliott, Amanda; Rankin, Bruce. The Effects of Neighborhood Disadvantage on Adolescent Development. Journal of Research in Crime and Delinquency. 1996; 33(4):389–426.

Faris, Robert E.; Dunham, Warren H. Mental Disorders in Urban Areas: An Ecological Study of Schizophrenia and Other Psychoses. Chicago: University of Chicago Press; 1939.

Faust, Katherine. Centrality in Affiliation Networks. Social Networks. 1997; 19(2):157–191.

Feld, Scott L. Structural Embeddedness and Stability of Interpersonal Relations. Social Networks. 1997; 19:91–95.

Field, Sam; Frank, Kenneth A.; Schiller, Kathryn; Riegle-Crumb, Catherine; Muller, Chandra. Identifying Positions From Affiliation Networks: Preserving the Duality of People and Events. Social Networks. 2006; 28(2):97–123. [PubMed: 20354579]

Finkelstein, Joseph; Cabrera, Manuel R.; Hripcsak, George. Internet-Based Home Asthma Telemonitoring: Can Patients Handle the Technology? Chest. 2000; 117(1):148–155. [PubMed: 10631213]

Frank, Kenneth A.; Muller, Chandra; Schiller, Kathryn S.; Riegle-Crumb, Catherine; Mueller, Anna Strassmann; Crosnoe, Robert; Pearson, Jennifer. The Social Dynamics of Mathematics Coursetaking in High School. The American Journal of Sociology. 2008; 113(6):1645–1696.

Freeman, Mark; Csikszentmihalyi, Mihaly; Larson, Reed W. Adolescence and Its Recollection: Toward an Interpretive Model of Development. Merrill-Palmer Quarterly. 1986; 32(2):167–185.

Furstenberg, Frank F.; Cook, Thomas D.; Eccles, Jacquelynne; Elder, Glen H. Managing To Make It: Urban Families and Adolescent Success. Chicago: University of Chicago Press; 1999.

Galster, George C. The Mechanism(s) of Neighbourhood Effects: Theory, Evidence, and Policy Implications. In: van Ham, Maarten; Manley, David; Bailey, Nick; Simpson, Ludi; Maclennan, Duncan, editors. Neighbourhood Effects Research: New Perspectives. New York: Springer; 2012. p. 23-56.

Gardner, Margo; Brooks-Gunn, Jeanne. Adolescents' Exposure to Community Violence: Are Neighborhood Youth Organizations Protective? Journal of Community Psychology. 2009; 37(4): 505–525. [PubMed: 21666761]

Gardner, Margo; Browning, Christopher R.; Brooks-Gunn, Jeanne. Can Organized Youth Activities Protect Against Internalizing Problems Among Adolescents Living in Violent Homes? Journal of Research on Adolescence. 2012; 22(4):662–677. [PubMed: 23162370]

Gehl, Jan. Life Between Buildings. Washington, DC: Island Press; 2011.

Granovetter, Mark S. The Strength of Weak Ties. American Journal of Sociology. 1973; 78(6):1360–1380.

Hägerstrand, Torsten. What About People in Regional Science? Papers of the Regional Science Association. 1970; 24(1):6–21.

Harris, Kathleen Mullan. An Integrative Approach to Health. Demography. 2010; 47(1):1–22. [PubMed: 20355681]

Hufford, Michael R.; Shields, Alan L.; Shiffman, Saul; Paty, Jean; Balabanis, Mark. Reactivity to Ecological Momentary Assessment. Psychology of Addictive Behaviors. 2002; 16(3):205–211. [PubMed: 12236455]

Ihlanfeldt, Keith R. The Geography of Economic and Social Opportunity in Metropolitan Areas. In: Altshuler, Alan; Morrill, William; Woldman, Harold; Mitchell, Faith, editors. Governance and Opportunity in Metropolitan America. Washington, DC: National Academy Press; 1999. p. 437-446.

Inagami, Sanae; Cohen, Deborah A.; Finch, Brian K. Non-Residential Neighborhood Exposures Suppress Neighborhood Effects on Self-Rated Health. Social Science & Medicine. 2007; 65(8): 1779–1791. [PubMed: 17614175]

Isaacs, Reginald. Are Urban Neighborhoods Possible? Journal of Housing. 1948; 6(1):177–180.

Jacobs, Jane. The Death and Life of Great American Cities. New York: Random House; 1961.

Joseph, Mark L.; Chaskin, Robert J.; Webber, Henry S. The Theoretical Basis for Addressing Poverty Through Mixed-Income Development. Urban Affairs Review. 2007; 42(3):369–409.

Kasarda, John D.; Janowitz, Morris. Community Attachment in Mass Society. American Sociological Review. 1974; 39(3):328–339.

Kornhauser, Ruth. Social Sources of Delinquency. Chicago: University of Chicago Press; 1978.

Kubrin, Charis E.; Weitzer, Ronald. New Directions in Social Disorganization Theory. Journal of Research in Crime and Delinquency. 2003; 40(4):374–402.

Kwan, Mei-Po; Peterson, Ruth D.; Browning, Christopher R.; Burrington, Lori A.; Calder, Catherine A.; Krivo, Lauren J. Reconceptualizing Sociogeographic Context for the Study of Drug Use, Abuse, and Addiction. In: Thomas, Yonette F.; Richardson, Douglas; Cheung, Ivan, editors. Geography and Drug Addiction. New York: Springer; 2008. p. 437-446.

Lareau, Annette. Unequal Childhoods: Class, Race, and Family Life. Berkeley: University of California Press; 2011.

Larson, Reed W. Beeping Children and Adolescents: A Method for Studying Time Use and Daily Experience. Journal of Youth and Adolescence. 1989; 18(6):511–530. [PubMed: 24272123]

Larson, Reed W.; Csikszentmihalyi, Mihaly; Graef, Ronald. Mood Variability and the Psychosocial Adjustment of Adolescents. Journal of Youth and Adolescence. 1980; 9(6):469–490. [PubMed: 24318310]

Leventhal, Tama; Brooks-Gunn, Jeanne. The Neighborhoods They Live In: The Effects of Neighborhood Residence on Child and Adolescent Outcomes. Psychological Bulletin. 2000; 126(2):309–337. [PubMed: 10748645]

Lewis, Valerie A.; Emerson, Michael O.; Klineberg, Stephen L. Who We'll Live With: Neighborhood Racial Composition Preferences of Whites, Blacks and Latinos. Social Forces. 2011; 89(4):1385–1407.

Maimon, David; Browning, Christopher R. Unstructured Socializing, Collective Efficacy, and Violent Behavior Among Urban Youth. Criminology. 2010; 48(2):443–474.

Mårtensson, Solveig. Childhood Interaction and Temporal Organization. Economic Geography. 1977; 53(2):99–125.

Mason, Michael J. Attributing Activity Space As Risky and Safe: The Social Dimension to the Meaning of Place for Urban Adolescents. Health and Place. 2010; 16(5):926–933. [PubMed: 20537934]

Mason, Michael J.; Schmidt, Christopher; Mennis, Jeremy. Dimensions of Religiosity and Access to Religious Social Capital: Correlates With Substance Use Among Urban Adolescents. The Journal of Primary Prevention. 2012; 33(5–6):229–237. [PubMed: 23139081]

Mason, Michael J.; Valente, Thomas W.; Douglas Coatsworth, J.; Mennis, Jeremy; Lawrence, Frank; Zelenak, Patricia. Place-Based Social Network Quality and Correlates of Substance Use Among Urban Adolescents. Journal of Adolescence. 2010; 33(3):419–427. [PubMed: 19665785]

Matthews, Stephen A.; Yang, Tse-Chuan. Spatial Polygamy and Contextual Exposures (SPACEs): Promoting Activity Space Approaches in Research on Place and Health. American Behavioral Scientist. 2013; 57:1057–1081. [PubMed: 24707055]

McKenzie, Roderick D. The Neighborhood: A Study of Local Life in the City of Columbus, Ohio. American Journal of Sociology. 1921; 27:145–168.

McRoberts, Omar. Streets of Glory: Church and Community in a Black Urban Neighborhood. Chicago: University of Chicago Press; 2003.

Mears, Daniel P.; Bhati, Avinash S. No Community Is an Island: The Effects of Resource Deprivation on Urban Violence in Spatially and Socially Proximate Communities. Criminology. 2006; 44(3): 509–548.

Mennis, Jeremy; Mason, Michael J. People, Places, and Adolescent Substance Use: Integrating Activity Space and Social Network Data for Analyzing Health Behavior. Annals of the Association of American Geographers. 2011; 101(1):272–291.

Mermelstein, Robin; Hedeker, Donald; Flay, Brian; Shiffman, Saul. Real-Time Data Capture and Adolescent Cigarette Smoking: Moods and Smoking. In: Stone, Arthur A.; Shiffman, Saul; Atienza, Audie A.; Nebeling, Linda, editors. The Science of Real-Time Data Capture: Self-Reports in Health Research. Oxford, United Kingdom: Oxford University Press; 2007. p. 117-135.

Merry, Sally Engle. Urban Danger: Life in a Neighborhood of Strangers. Philadelphia: Temple University Press; 1981.

Miller, Harvey J. Modeling Accessibility Using Space-Time Prism Concepts Within Geographical Information Systems. International Journal of Geographical Information Systems. 1991; 5(3):287–301.

Molnar, Beth E.; Cerda, Magdalena; Roberts, Andrea L.; Buka, Stephen L. Effects of Neighborhood Resources on Aggressive and Delinquent Behaviors Among Urban Youths. American Journal of Public Health. 2008; 98(6):1086–1093. [PubMed: 17901441]

Morenoff, Jeffrey D.; Sampson, Robert J.; Raudenbush, Stephen W. Neighborhood Inequality, Collective Efficacy, and the Spatial Dynamics of Urban Violence. Criminology. 2001; 39(3):517–558.

Nemet, Gregory F.; Bailey, Adrian J. Distance and Health Care Utilization Among the Rural Elderly. Social Science & Medicine. 2000; 50(9):1197–1208. [PubMed: 10728841]

Newsome, Tracy H.; Walcott, Wayne A.; Smith, Paul D. Urban Activity Spaces: Illustrations and Application of a Conceptual Model for Integrating the Time and Space Dimensions. Transportation. 1998; 25(4):357–377.

Osgood, D Wayne; Anderson, Amy L.; Shaffer, Jennifer N. Unstructured Leisure in the After-School Hours. In: Mahoney, Joseph L.; Larson, Reed W.; Eccles, Jacquelynne S., editors. Organized Activities As Contexts of Development: Extracurricular Activities, After-School and Community Programs. Mahwah, NJ: Lawrence Erlbaum and Associates; 2005. p. 45-64.

Osgood, D Wayne; Wilson, Janet K.; O'Malley, Patrick M.; Bachman, Jerald G.; Johnston, Lloyd D. Routine Activities and Individual Deviant Behavior. American Sociological Review. 1996; 61(4): 635–655.

Pager, Devah; Shepherd, Hana. The Sociology of Discrimination: Racial Discrimination in Employment, Housing, Credit, and Consumer Markets. Annual Review of Sociology. 2008; 34:181–209.

Park, Robert; Burgess, Ernest W.; McKenzie, Roderick D. The City: Suggestions for the Study of Human Nature in the Urban Environment. Chicago: University of Chicago Press; 1925.

Pattillo-McCoy, Mary. Black Picket Fences. Chicago: University of Chicago Press; 1999.

Putnam, Robert D. E Pluribus Unum: Diversity and Community in the Twenty-First Century. Scandinavian Political Studies. 2007; 30:137–174.

Rankin, Bruce; Quane, James M. Social Context and Urban Adolescent Outcomes: The Interrelated Effects of Neighborhoods, Families, and Peers on African-American Youth. Social Problems. 2002; 49(1):79–100.

Sampson, Robert J. Great American City: Chicago and the Enduring Neighborhood Effect. Chicago: University of Chicago Press; 2012.

Sampson, Robert J.; Morenoff, Jeffrey D.; Gannon-Rowley, Thomas. Assessing 'Neighborhood Effects': Social Processes and New Directions in Research. Annual Review of Sociology. 2002; 28:443–478.

Sampson, Robert J.; Raudenbush, Stephen W.; Earls, Felton J. Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy. Science. 1997; 277(5328):918–924. [PubMed: 9252316]

Sastry, Narayan; Ghosh-Dastidar, Bonnie; Adams, John; Pebley, Anne R. The Design of a Multilevel Survey of Children, Families, and Communities: The Los Angeles Family and Neighborhood Survey. Social Science Research. 2006; 35(4):1000–1024.

Sastry, Narayan; Pebley, Ann R.; Zonta, Michela. Neighborhood Definitions and the Spatial Dimension of Daily Life in Los Angeles. Paper presented at the 2002 annual meeting of the Population Association of America; Atlanta, GA. May 9–11; 2002.

Scarborough, Brittney K.; Like-Haislip, Toya Z.; Novak, Kenneth J.; Lucas, Wayne L.; Alarid, Leanne F. Assessing the Relationship Between Individual Characteristics, Neighborhood Context, and Fear of Crime. Journal of Criminal Justice. 2010; 38(4):819–826.

Schönfelder, Stefan; Axhausen, Kay W. Activity Spaces: Measures of Social Exclusion? Transport Policy. 2003; 10(4):273–286.

Schönfelder, Stefan; Axhausen, Kay W. Arbeitsbericht Verkehrsund Raumplanung. Vol. 135. Zürich, Switzerland: Institut für Verkehrsplanung und Transportsysteme (IVT), ETH Zürich; 2002. Measuring the Size and Structure of Human Activity Spaces—The Longitudinal Perspective.

Shaw, Clifford; McKay, Henry D. Juvenile Delinquency and Urban Areas. Chicago: University of Chicago Press; 1942.

Shiffman, Saul. Ecological Momentary Assessment (EMA) in Studies of Substance Use. Psychological Assessment. 2009; 21(4):486–497. [PubMed: 19947783]

Shiffman, Saul; Stone, Arthur A.; Hufford, Michael R. Ecological Momentary Assessment. Annual Review of Clinical Psychology. 2007; 4(1):1–32.

Shrier, Lydia A.; Shih, Mei-Chiung; Beardslee, William R. Affect and Sexual Behavior in Adolescents: A Review of the Literature and Comparison of Momentary Sampling With Diary and Retrospective Self-Report Methods of Measurement. Pediatrics. 2005; 115(5):573–581.

Simcha-Fagan, Om; Schwartz, Joseph E. Neighborhood and Delinquency: An Assessment of Contextual Effects. Criminology. 1986; 24(4):667–699.

Small, Mario L. Unanticipated Gains: Origins of Network Inequality in Everyday Life. New York: Oxford University Press; 2009.

Small, Mario L.; McDermott, Monica. The Presence of Organizational Resources in Poor Urban Neighborhoods: An Analysis of Average and Contextual Effects. Social Forces. 2006; 84(3): 1697–1724.

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

Taylor, Ralph B. Human Territorial Functioning. Cambridge, United Kingdom: Cambridge University Press; 1988.

Thiele, Claudia; Laireiter, Anton-Rupert; Baumann, Urs. Diaries in Clinical Psychology and Psychotherapy: A Selective Review. Clinical Psychology & Psychotherapy. 2002; 9(1):1–37.

Todd, Michael; Armeli, Stephen; Tennen, Howard; Carney, Margaret Anne; Affleck, Glenn. A Daily Diary Validity Test of Drinking To Cope Measures. Psychology of Addictive Behaviors. 2003; 17(4):303–311. [PubMed: 14640826]

Tseng, Vivian; Seidman, Edward. A Systems Framework for Understanding Social Settings. American Journal of Community Psychology. 2007; 39(3–4):217–228. [PubMed: 17436080]

Warner, Barbara D.; Rountree, Pamela Wilcox. Local Social Ties in a Community and Crime Model: Questioning the Systemic Nature of Informal Social Control. Social Problems. 1997; 44(4):520–536.

Wikström, Per-Olof H.; Oberwittler, Dietrich; Treiber, Kyle; Hardie, Beth. Breaking Rules: The Social and Situational Dynamics of Young People's Urban Crime. Oxford, United Kingdom: Oxford University Press; 2012.

Wilson, William J. When Work Disappears: The World of the New Urban Poor. New York: Knopf; 1996.

Wilson, William J. The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. Chicago: University of Chicago Press; 1987.

Wolch, Jennifer; Wilson, John; Fehrenbach, Jed. Parks and Park Funding in Los Angeles: An Equity-Mapping Analysis. Urban Geography. 2005; 26(1):4–35.

Wyant, Brian R. Multilevel Impacts of Perceived Incivilities and Perceptions of Crime Risk on Fear of Crime: Isolating Endogenous Impacts. Journal of Research in Crime and Delinquency. 2008; 45(1):39–64.

Xue, Yange; Leventhal, Tama; Brooks-Gunn, Jeanne; Earls, Felton J. Neighborhood Residence and Mental Health Problems of 5- to 11-Year-Olds. Archives of General Psychiatry. 2005; 62(5):554–563. [PubMed: 15867109]

Zenk, Shannon N.; Schulz, Amy J.; Israel, Barbara A.; James, Sherman A.; Bao, Shuming; Wilson, Mark L. Neighborhood Racial Composition, Neighborhood Poverty, and the Spatial Accessibility of Supermarkets in Metropolitan Detroit. American Journal of Public Health. 2005; 95(4):660–667. [PubMed: 15798127]

Additional Reading

Kwan, Mei-Po. From Place-Based to People-Based Exposure Measures. Social Science and Medicine. 2009; 69(9):1311–1313. [PubMed: 19665828]

Sampson, Robert J.; Morenoff, Jeffrey D.; Earls, Felton J. Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children. American Sociological Review. 1999; 64(5):633–660.

Small, Mario Luis. Neighborhood Institutions As Resource Brokers: Childcare Centers, Interorganizational Ties, and Resource Access Among the Poor. Social Problems. 2006; 53(2):274–292.
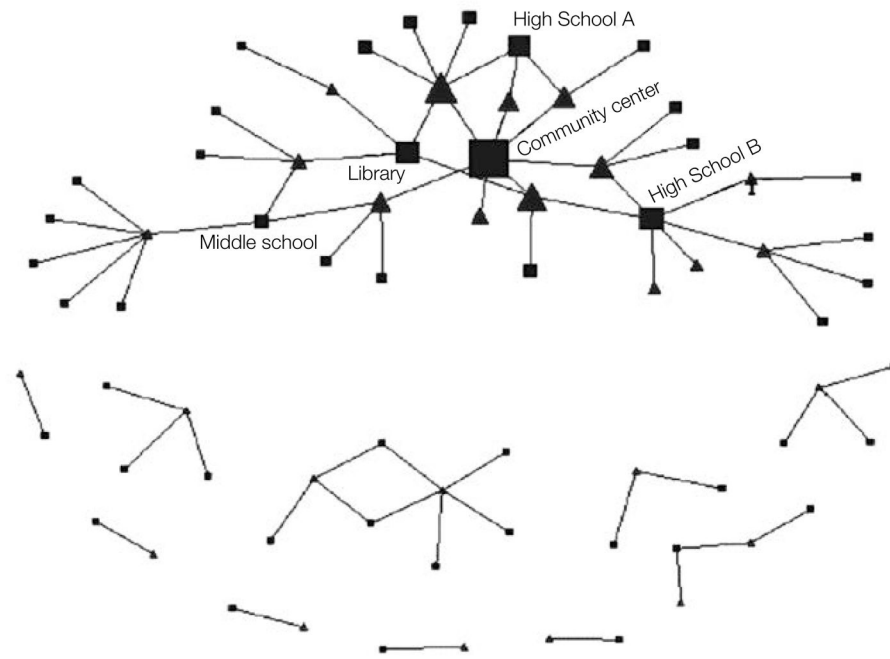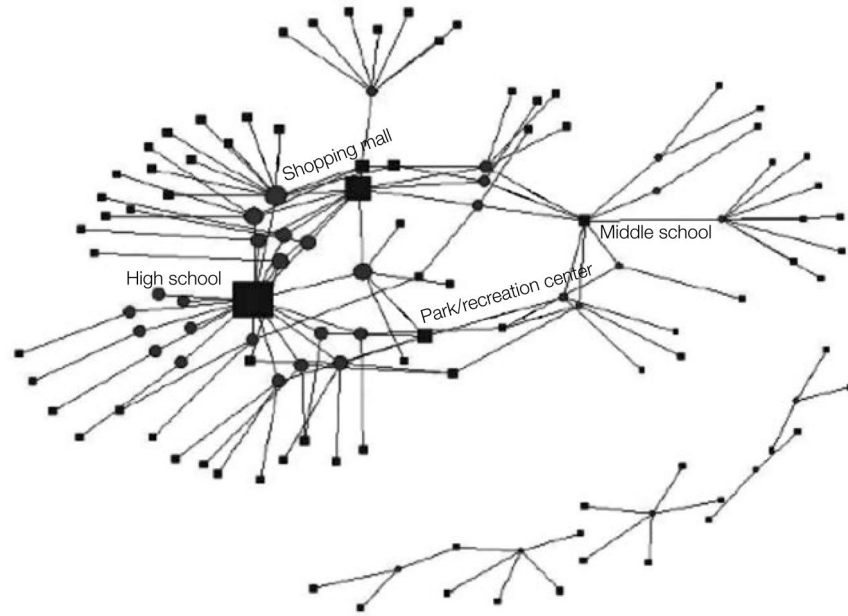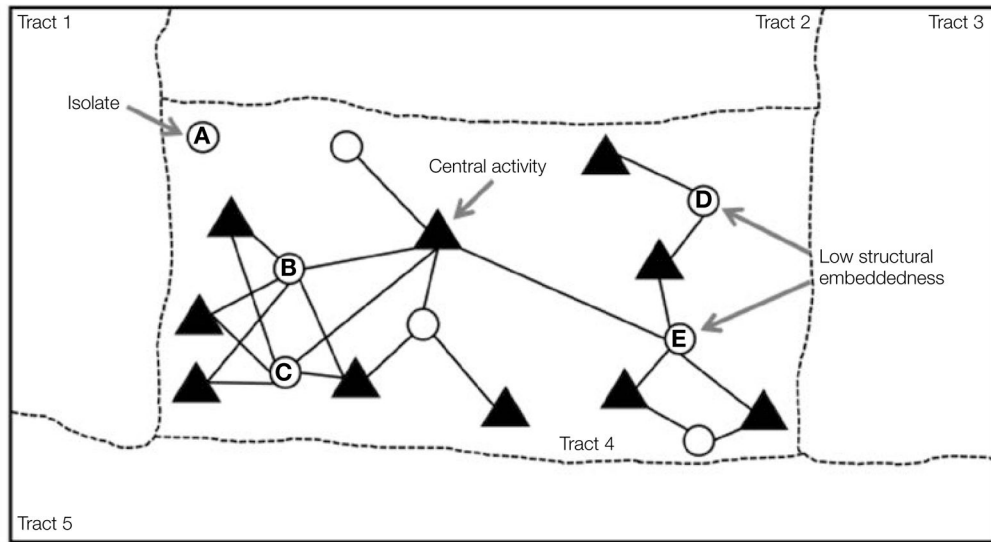
Exhibit 1.

Actor-Setting Affiliation Network, Low-Income Census Tract

Notes: Squares represent activity settings. Triangles represent youth. Shapes are weighted by network centrality.

Exhibit 2.
Actor-Setting Affiliation Network, High-Income Census Tract
Notes: Squares represent activity settings. Circles represent youth. Shapes are weighted by network centrality.

Panel I: Neighborhood Ecological Network (Tract 4)

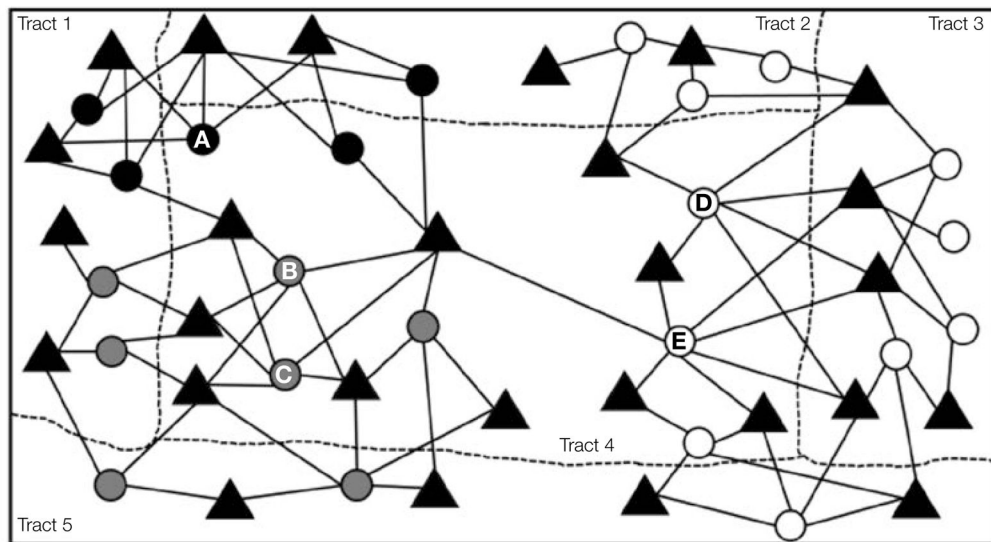**Panel II: Community Ecological Network**

Exhibit 3.

Illustration of Neighborhood and Community Ecological Networks

Notes: Triangles represent activity spaces. Circles represent youth.