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Putting Families Into Place: Using Neighborhood-Effects Research and Activity Spaces to Understand Families

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Abstract

Neighborhood is an important context in which individuals and families are embedded. Yet family studies researchers have been relatively slow to incorporate spatial approaches into family science. Although limited theoretical and methodological attention has been devoted to families in neighborhood-effects research, family scholars can contribute greatly to theories about neighborhood effects, and neighborhood-effects research can help move the field of family studies forward. This article reviews the theories, applications, and limitations of research on neighborhood effects and discusses how family studies can benefit from incorporating a spatial perspective from neighborhood-effects research. I then present an innovative methodology—referred to as activity spaces—emerging in neighborhood-effects research, and I discuss how this approach can be used to better understand the complexity and heterogeneity of families. Last, I highlight ways to incorporate space into family studies by “putting families into place.”

Keywords

Activity spaces; family studies; neighborhood effects

The increasing complexity and heterogeneity of families requires research to move beyond studying the average response or outcomes of individuals and families to studying the variations, outliers, and contradictions in family studies (Coontz, 2015). It is thus imperative to study families across time and space. Because families differ along these two dimensions (Voss, 2007), incorporating them into family studies can elucidate some of the specific mechanisms by which variations and contradictions are generated. Family science has been at the forefront of attending to the temporal dimension by cultivating a longitudinal perspective in studying families. Time-use surveys and the development of various longitudinal methodologies are also examples of how family studies have successfully incorporated time as an important dimension of research. However, the incorporation of space (i.e., abstract geometries without material form or cultural interpretation) and place (i.e., geographic locations invested with social meanings and values) (Gieryn, 2000; Hillier & Hanson, 1984) into family studies has been slower than in other disciplines.

Health researchers have led major initiatives to develop spatial approaches (de Castro, 2007), with “explosions” of research interest in applications of spatial approaches in health research in the past few decades (Macintyre, Ellaway, & Cummins, 2002; Voss, 2007). At the forefront of this scholarly momentum to incorporate space and place is neighborhood-effects research, which moves beyond the typical approach of focusing only on individual- and family-level factors to consider contextual-level factors that are typically measured at the neighborhood level to understand individual outcomes. However, one of the most critical limitations of current neighborhood-effects research is its lack of attention to families. Families have been represented in neighborhood-effects research, but they remain at the margin because of limited theoretical and methodological attention devoted to family variables in neighborhood-effects research (Burton & Robin, 2000). Relatively few studies have considered families and neighborhoods concurrently to investigate how they may interact and conjointly affect individuals. As this review shows, however, family studies has the potential to advance neighborhood-effects research, and incorporating neighborhood into family studies can advance scholarship by putting family into place (Entwisle, 2007).

Linking Neighborhood-Effects Research and Family Studies

In this article, I provide a review of neighborhood-effects research literature in sociology and urge family studies researchers to incorporate neighborhood factors in studying families. First, I review the theoretical development of neighborhood-effects research, and I discuss theoretically driven approaches to incorporating neighborhoods into family studies by highlighting the empirical studies that have successfully done so when investigating individual and family outcomes. Second, I discuss the empirical limitations of current neighborhood-effects research, reviewing the current state of the field as well as existing research gaps. Third, I introduce an emerging and innovative methodology in neighborhood-effects research: the activity spaces approach. Finally, I discuss how incorporating activity spaces can advance scholarship in family science, and I provide suggestions for future research by rejecting the simplistic approach of traditional neighborhood-effects research.

Theoretical Development of Neighborhood-Effects Research

Although increased scholarly interest in neighborhood-effects research is recent, related interest in neighborhoods and their relationships with individual outcomes are deeply rooted in sociological theory. For example, classic sociological research reaching back to 1897 has investigated the relationship between the characteristics of urban areas and negative outcomes for individuals, such as alienation, isolation, and increased rates of suicide (Durkheim, 1897). During the early 20th century, urban sociologists—especially those from the Chicago School—led the initial theoretical development of neighborhood-effects studies. Part of this theoretical development relates to the conceptualization of neighborhood. Robert Park (1915) of the Chicago School defined (urban) neighborhoods as discrete local entities where social processes and interactions occur, a conceptualization that draws on the distinction between place and space: Places are geographic locations invested with social meanings and values, whereas spaces are merely abstract geometries without material form or cultural interpretation (Gieryn, 2000; Hillier & Hanson, 1984). In other words, neighborhoods are places that cannot be defined exclusively in spatial terms (Gieryn, 2000).

Building on this conceptualization of neighborhoods and classic sociological theories, divergent theories on the relationship between urbanism (on a demographic scale) and individuals' well-being have assumed that neighborhoods—conceptualized as city or metropolitan contexts—have negative (Simmel, 1903; Tönnies, 1955; Wirth, 1938), neutral (Fischer, 1975; Gans, 1962), or positive (Hawley, 1986; Jacobs, 1961) effects on individuals.

Moving beyond the initial theoretical explorations of the relationship between neighborhood scale and individuals' well-being, scholars expanded the scope of their research by investigating the effects of other neighborhood characteristics. In a highly influential investigation that shifted the paradigm of neighborhood studies, Shaw and McKay (1942) examined the role of neighborhood social disorganization—that is, the inability of a community to realize common values of its residents and to maintain social control (Sampson & Groves, 1989)—emphasizing the roles of neighborhood poverty, residential instability (high turnover), and racial/ethnic heterogeneity. Shaw and McKay (1942) found that high levels of social disorganization, as measured by abandoned or dilapidated housing and criminal activities, are associated with adolescents' criminal behaviors. A few decades later, Kasarda and Janowitz (1974) expanded this research when they investigated the mechanisms linking neighborhood structural characteristics and individual outcomes by looking at informal social networks and community attachment. In particular, they found that social disorganization, along with length of residence in a neighborhood, negatively influences individual outcomes. Sampson, Raudenbush, and Earls (1997) further extended the theory of neighborhood effects by investigating the role of “collective efficacy,” referring to the combination of trust and cohesion among residents in a neighborhood that allows for social control. They found that collective efficacy affects perceived neighborhood violence and victimization, and that collective efficacy moderates the relationship between residential stability and violence. In short, collective efficacy is one of the mechanisms by which social relationships and social networks in the neighborhood moderate and/or mediate the relationships between neighborhoods' structural factors and individual outcomes.

Although the momentum of theoretical development of neighborhood-effects research has slowed since the early 2000s (for important recent exceptions, see Sampson, 2012; Sharkey & Faber, 2014), the empirical applications of neighborhood-effects research have been revamped in the past few decades as new data, software, and methods have become more readily available (Entwisle, 2007). The number of neighborhood-effects studies has skyrocketed, and scholars have started to investigate multiple dimensions of neighborhoods beyond neighborhood socioeconomic status. For example, previous studies investigated the role of the physical environment, the social environment (e.g., social capital, social interactions in the neighborhood), and the symbolic environment (e.g., representations and identities), as well as other dimensions of neighborhoods (Chaix et al., 2012). In addition to the broader spectrum of neighborhood characteristics being investigated, the neighborhood-effects research field has witnessed significant methodological development, including the development of various geographically informed statistical models (e.g., spatial lag, spatial error, and geographically weighted regression). Despite these empirical applications and methodological development, the lack of theoretical expansion remains one of the most importance challenges in neighborhood-effects research (Entwisle, 2007).

A Critical Missing Piece in Neighborhood-Effects Theories: The Role of Families

The underdevelopment of theory to guide neighborhood-effects research is partially due to the lack of explicit consideration of families. Although neighborhood-effects research expands the traditional focus of individual-level influences on individual outcomes, it largely ignores the role of families (Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997; Simons, Lin, Gordon, Brody, & Conger, 2002). Family factors may be considered in the framing of research questions, but “the conceptual and methodological treatment of family variables range from unspecified and vaguely implied to modestly defined and measured in most studies” (Burton & Robin, 2000, p. 1115). For example, in an influential review, Jencks and Mayer (1990) suggested five mechanisms by which neighborhood characteristics affect child outcomes, yet they ignored the role of families in mediating and moderating neighborhood influences (Burton & Robin, 2000).

The inclusion of families in neighborhood-effects research is essential because families are critical microsystems that embed individual members within the larger ecological system (Cox & Paley, 1997). Moreover, families themselves are embedded in larger contexts, such as neighborhoods (Bronfenbrenner, 1979; Bronfenbrenner & Morris, 1998). Families critically influence individual outcomes, given that the family is typically an individual’s earliest and most foundational context. But family is also important for studying neighborhood effects because families are often the units that make decisions about neighborhoods and that absorb neighborhood effects. For example, parents’ desires to move to a neighborhood with a good school district will significantly influence residential choice and mobility decisions (Lareau & Goyette, 2014). Furthermore, families may be particularly influential in determining neighborhood effects on children, because children typically have little agency in choosing their own neighborhoods. In this regard, family studies can challenge the typical approach of neighborhood-effects research by highlighting the need to consider individuals, families, and households as units of analysis for some outcomes.

Incorporating Neighborhoods Into Family Studies

Perhaps more important than the potential contributions of family studies scholars to the development of neighborhood-effects theories are the substantial benefits to family science from the incorporation of space and place for studying family variations. Studies that focus only on families can be problematic because families are embedded in larger social contexts such as neighborhoods (Bronfenbrenner, 1979); thus, the exclusion of neighborhoods can lead to serious specification errors, either from omitted variables bias producing overestimates of the effects of included variables or from possible interactions between family and neighborhoods (Parcel, Dufur, & Cornell Zito, 2010). Furthermore, incorporating neighborhoods into family studies can help elucidate the specific mechanisms through which nonproximate factors (i.e., neighborhood) matter for individual outcomes through their influences on proximate factors (i.e., family) and for families.

Families have largely remained at the margin in neighborhood-effects research because of limited theoretical and methodological attention devoted to family variables (Burton & Robin, 2000). It is critical to acknowledge the important contributions that family studies researchers have made to neighborhood-effects research by investigating (a) family as a

moderator, (b) family as a mediator, (c) neighborhood as a moderator, and (d) neighborhood as a mediator for understanding individual outcomes (see Figure 1 for a visual representation of these conceptual models).

First, the parental-buffering hypothesis states that the negative effects of disadvantaged neighborhoods on children are moderated by parental behaviors (see Figure 1a). For example, McKelvey, Connors-Burrow, Mesman, Pemberton, and Casey (2014) found that a supportive family environment—measured by family-level cohesion—can attenuate the negative effects of community violence and other characteristics of disadvantaged neighborhoods.

Second, the environmental-stress model suggests that negative neighborhood characteristics affect children but are mediated by parenting and family processes (see Figure 1b). For example, Pachter, Auinger, Palmer, and Weitzman (2006) found that neighborhood effects on children's internalizing and externalizing problems are partially or fully mediated through parenting.

Third, several models have been proposed to examine the role of neighborhood as a moderator. The amplified-disadvantage model states that the negative impacts of family-level risk factors (e.g., harsh parenting, inconsistent discipline) are magnified in socioeconomically disadvantaged neighborhoods (see Figure 1c). The family-compensatory-effects model argues that positive family-level protective factors (e.g., high nurturance, parental involvement) are more important for children in socioeconomically disadvantaged neighborhoods than for children in other neighborhoods (see Figure 1c). These two models suggest that the influence of family-level factors on child outcomes can be moderated by the neighborhood context. For example, Yonas et al. (2010) found that neighborhood characteristics moderate the relationship between child maltreatment and outcomes in adulthood by working as a buffer for the negative effects of child maltreatment.

Fourth, the contextual-dissipation model explains that positive family-level protective and harmful factors can disappear in, or are completely overwhelmed by, disadvantaged neighborhood characteristics (see Figure 1d). For example, Simons et al. (2002) found that the deterrent effect of negative parenting (measured by caretaker control and corporal punishment) disappears when these parenting behaviors are widespread and thus normative within a community.

Most neighborhood-effects studies primarily focus on individual outcomes, with fewer studies focused on the roles of neighborhoods on family outcomes, such as family stress (e.g., family conflict, parental depression) and family resilience (e.g., family belief systems, communication and problem solving) (important exceptions are studies examining neighborhood effects on maternal mental health: Klebanov, Brooks-Gunn, & Duncan, 1994; Kotchick, Dorsey, & Heller, 2005). Key constructs of research on families are critical for informing the mechanisms by which neighborhoods contribute to individual and family outcomes. Furthermore, neighborhood-effects studies focusing on families as the unit of analysis can aid the design of more effective place-based public policies to address the needs of families rather than individuals.

Empirical Limitations in Neighborhood-Effects Research

As discussed earlier, the potential contribution of family studies to theoretical development in neighborhood-effects research is great, and a better integration of neighborhood studies and family studies can advance both fields. In this section, I provide a comprehensive overview of neighborhood-effects research and its methodological limitations, setting the stage for a discussion of how the innovative activity spaces methodology addresses these limitations.

Definition of Neighborhoods

One of the most important limitations of neighborhood-effects research stems from the operationalization of neighborhoods. Most commonly, neighborhoods are operationalized by the use of administratively defined units, such as census tracts or census blocks. The great majority of neighborhood-effects studies simply define individuals' neighborhoods as the census tract or census block of their residence. The use of such administratively defined boundaries makes analysis feasible (Basta, Richmond, & Wiebe, 2010), and some researchers have argued that such delimitations of neighborhood can have sociological meaning (Lebel, Pampalon, & Villeneuve, 2007).

Despite these practical advantages, administratively defined units may not be accurate proxies for individuals' neighborhoods because such units may not represent individuals' unique spatial experiences (Perchoux, Chaix, Cummins, & Kestens, 2013). For example, individuals and families who live near the boundaries of the unit may have qualitatively different spatial experiences than individuals and families who live near the center of the unit (Chaix et al., 2012; Perchoux et al., 2013). The former may reside in that unit but spend the majority of their working and leisure hours in the adjacent administratively defined unit. In this case, using the administratively defined unit corresponding to their residence will not accurately capture their actual lived experience in their neighborhoods. Furthermore, individuals' perceptions of neighborhood size, recognition of neighborhood names, and boundaries vary significantly (Lee & Campbell, 1997; Pebley & Sastry, 2009).

Using an administratively defined unit of residence as a measure of neighborhood can lead to residential trap bias, or restricting of the influence of neighborhood context to the residential context (Perchoux et al., 2013). In addition, focusing only on the local area can lead to local trap bias, which ignores the influence of nonresidential neighborhoods and nonlocal areas (Purcell & Brown, 2005). Empirical evidence shows that residential neighborhood characteristics differ significantly from workplace neighborhood characteristics; for example, segregation levels in the workplace neighborhoods are, on average, much lower than individuals' residential neighborhoods (Ellis, Wright, & Parks, 2004). Thus, defining individuals' residential contexts as their neighborhoods ignores this "spatial polygamy" (Matthews & Yang, 2013). Census tracts are quite small, on average, covering about one square mile, especially in urban areas (Matthews & Yang, 2013). Thus, individuals and families are very likely to be exposed to multiple administratively defined units in their daily lives if they work or participate in other activities outside their residential neighborhood. In addition, lived neighborhoods differ by individual characteristics. For example, individuals with a long commute to work may spend most of their time in a

neighborhood other than their neighborhood of residence. Also, children in child care may spend more time in a neighborhood of a caretaker, such as a grandparent, rather than their neighborhood of residence.

Scale of Neighborhood and Inferential Errors

Even if we accept the assumption that administratively defined units adequately represent the unique spatial experiences of individuals and families, using these units can introduce two significant problems: the modifiable areal unit problem, or MAUP (Openshaw, 1983) and the uncertain geographic context problem, or UGCoP (Kwan, 2012). First, MAUP is essentially a spatial ecological fallacy problem with two components (de Castro, 2007): a scale effect, in which using different scales may produce different results, and a zoning effect, in which regrouping zones may produce different results (Fotheringham, Brunsdon, & Charlton, 2000). That is, when point-based measures of spatial phenomena are aggregated to larger spatial units, the zoning and scale of the aggregation can produce different results. For example, using census tracts or zip codes as proxies for individuals' neighborhoods may create discrepancies.

Second, the UGCoP implies that neighborhood effects can be affected by how administratively defined units differ from the accurate, causally relevant geographic context (Kwan, 2012). For example, a smaller geographic unit, such as a census tract, may be the causally relevant geographic context for assessing the effects of social relationships within the neighborhoods; in contrast, a larger geographic unit, such as the county, may be the causally relevant geographic context for assessing the effects of large policy. Yet identifying the causally relevant geographic context is theoretically and empirically challenging. These two problems can lead to serious inferential errors (see Table 1). As Kwan (2012) demonstrated, misspecification of the geographic unit can lead to both false positive and erroneous negative findings.

Neighborhoods as Isolated Geographic Units

The current conceptualization of neighborhood is also limited in that it considers only immediate areas (e.g., the individual's own neighborhood) without investigating the impacts from the adjacent areas, treating neighborhoods as isolated geographic units. That is, the underlying assumption of the typical approach of using residential locations, such as using census tracts as proxies for neighborhoods, ignores the larger spatial processes that may occur among neighborhoods. Because social processes are spatially embedded, understanding the role of neighboring areas is theoretically important. Expanding the theoretical boundaries of neighborhood from intraneighborhood effects to interneighborhood effects, two mechanisms can be identified for understanding how neighborhood characteristics may influence individual outcomes: spatial spillover and social relativity. First, the spatial-spillover perspective hypothesizes that individual and family outcomes are related to the characteristics and processes of the neighboring areas in addition to individuals' and families' own immediate area through diffusion of ideas, practices, and resources (Capello, 2009; Rogers, 2010). For example, the opening of a family resource center in one neighborhood potentially affects not only residents of that particular neighborhood but also residents in surrounding neighborhoods. Second, the social-relativity

perspective hypothesizes that proximate neighborhoods serve as a point of comparison for individuals and families in assessing their own context (Wilkinson, 1997). For example, individuals and families who reside in a disadvantaged neighborhood surrounded by affluent neighborhoods may experience stronger negative neighborhood effects because their perceptions of the affluent neighborhoods may amplify their negative subjective perceptions of their own neighborhood.

Such limitations have been recognized in the health literature, which includes a scholarly push to expand the theoretical scope to examine the effects of contexts beyond the immediate residential area (Dietz, 2002; Matthews & Yang, 2013; Takagi, Ikeda, & Kawachi, 2012; Vallée, Cadot, Roustit, Parizot, & Chauvin, 2011). To address this issue, some studies have started using innovative modeling approaches, such as spatial Durbin modeling, that allow researchers to separate the direct (i.e., within-own-neighborhood) impact on individual outcomes from the indirect (i.e., to or from neighboring neighborhoods) impact (for more detailed discussion of the spatial Durbin approach and an empirical example, see Yang, Noah, & Shoff, 2013). Also, neighborhood-effects research incorporating an activity-space framework has increased dramatically in health studies. Yet most family studies focusing on neighborhood-effects continue to use the simplistic approach of accounting only for individuals' and families' immediate neighborhoods without considering both absolute and relative characteristics of neighborhoods (Dietz, 2002).

Assumption of Inevitability in Neighborhood-Effects Research

Another important potential problem in neighborhood-effects research is that the typical approach of using administratively defined units assumes equivalent exposure across residents and overlooks the role of human agency. The first assumption of this inevitability is that neighborhood influences are exogenous and universal to everyone living in the same neighborhood (Entwisle, 2007). However, effects of various neighborhood characteristics on individuals' outcomes operate differently across individuals (Macintyre & Ellaway, 2003; Vallée et al., 2011). For example, Kwan (1999) found that neighborhood effects on individuals significantly differ by gender because of gendered differences in accessibility and mobility. Individuals' neighborhood geospatial experiences also differ by other sociodemographic characteristics, such as race (Jones & Pebley, 2014), class, immigration status, and legal status.

The second assumption of the inevitability in neighborhood-effects research is that individuals are passive recipients of predetermined neighborhood influences (Entwisle, 2007). This assumption largely ignores the role of human agency, overlooking individuals' decision-making capacity regarding their own mobility. In response to negative conditions and changes in conditions of neighborhoods, individuals may move out of the neighborhood or limit their interactions in the neighborhood. In addition, individuals may employ different coping mechanisms (e.g., street efficacy, or the perceived ability to avoid dangerous situations and be safe in the neighborhood; Sharkey, 2006) to counteract the negative aspects of their neighborhood, some of which may positively affect outcomes. Scholars have increasingly argued for the importance of considering residential mobility and daily travel

patterns to account for individuals' agency (Browning & Soller, 2014; Graif, Gladfelter, & Matthews, 2014).

Given these limitations, some critiques have questioned the validity and applicability of neighborhood-effects research. However, with the strong need to incorporate multilevel contexts in theories for investigating individual and family outcomes, addressing these theoretical and methodological limitations is imperative. In addition, some scholars have argued that a relatively small effect of neighborhood factors may be underestimated and that such underestimation may be attributable to these limitations, particularly the misspecification of contextual boundaries (Spielman & Yoo, 2009). Thus, addressing these methodological limitations will help researchers to assess the causally relevant effects of neighborhoods. To address some of these limitations and to better capture individuals' and families' exposures and experiences of neighborhoods, new innovative perspectives and methodologies have emerged: these approaches can be largely categorized as egohood and activity-spaces approaches.

Methodological Innovation in Neighborhood-Effects Research

To address the current empirical limitations of neighborhood-effects research, scholars have proposed several person-centered approaches to study individuals' and families' neighborhoods (Browning & Soller, 2014; Hipp & Boessen, 2013). One approach centers on *egohoods*, or egocentric local environments, in which the individual is designated as the center of his or her neighborhood (Crowder & South, 2008; Hipp & Boessen, 2013; Reardon et al., 2008). Egohoods are constructed using a geographic information system (GIS) to create a buffer or to encircle the target individual's residential location. These egohoods may overlap with several census units, and the proportions of the area that are in different census units are recalculated to assess the characteristics of egohoods. In addition to creating a simple buffer (i.e., egohood), egocentric local environments incorporate the distance decay function, such that local environments have less influence as distance from residence increases. Although egohood measures move beyond the typical approach of using administratively defined geographic units as individuals' neighborhoods, this approach is subject to some of the same empirical limitations. For instance, it reduces individuals' neighborhood contexts to their residential contexts (i.e., is subject to residential trap bias), and decisions regarding the scale of the buffer (e.g., a buffer with approximately a mile radius) remain somewhat arbitrary.

Another innovative methodological approach in neighborhood-effects research is the concept of activity spaces, or "the subset of all locations within which an individual has direct contact as a result of his or her day-to-day activities" (Golledge & Stimson, 1997, p. 279), which reflect individuals' actual lived contexts (Jones & Pebley, 2014). The activity-spaces approach has a long history in various disciplines, including geography, public health, and sociology (Mason & Korpela, 2009). Geography has been at the forefront of developing the concept of activity spaces, with Hagerstrand's (1968) pioneering work on space-time geography providing the foundation for activity spaces. Despite the long history of the concept of activity spaces, neighborhood-effects research has paid little attention to individuals' activity patterns because of a lack of available data and methods (Basta et al.,

2010). However, activity-spaces approaches have been gaining traction and have been identified as an important way to conceptualize space and reduce methodological misspecification (Matthews & Yang, 2013).

The activity-spaces approach captures the fundamental mechanisms of neighborhood-effects research (Browning & Soller, 2014). It measures levels of exposure to different urban opportunities and resources based on individuals' activity patterns. The activity-spaces approach rejects the inevitability assumption of neighborhood-effects research that ignores individuals' agency in choosing and defining their own neighborhood. Instead, activity spaces are specifically defined for individuals. By assessing the actual geographic areas to which individuals are exposed, activity spaces bypass the use of administratively defined boundaries as proxies for individuals' neighborhoods and avoid residential and local trap biases. In addition, because activity spaces are constructed by individuals' actual travel patterns, they also use an appropriate scale for measuring neighborhoods. In other words, the activity spaces approach addresses most of the current limitations of neighborhood-effects research by allowing person-centered definitions of neighborhoods that can vary with individual characteristics.¹ For example, two mothers residing in a same residential neighborhood can have different activity spaces. The daily activities of a stay-at-home mother may center closely on her neighborhood of residence, whereas a mother residing in the same neighborhood who works outside the home may travel to multiple neighborhoods if she travels to take her children to day care, creating a different profile of activity spaces from that of the stay-at-home mother.

Activity spaces have been measured using three main approaches: a two-dimensional ellipse, kernel densities, and shortest-path networks (Schönfelder & Axhausen, 2003; Wong & Shaw, 2011) (see Figure 2a–c for a visualization of these methods). First, measuring a two-dimensional (standard deviational) ellipse of all the locations of regular activities has been the most prominent approach (Vallée et al., 2011; for a detailed illustration of how these ellipses are constructed, see Newsome, Walcott, & Smith, 1998). However, some scholars have argued that ellipses do not accurately represent the concept of exposure (Wong & Shaw, 2011) because the measure assumes that individuals know and experience all the areas covered by the ellipse surrounding the locations they visited. Second, kernel densities also use information about the locations the individual visited. The researcher calculates kernel densities by mapping kernel density distributions of visited locations (data points) and then overlapping those locations to derive a more continuous density surface showing the clustering of activities. Although kernel densities provide an excellent measure of individuals' travel patterns, the approach is not best suited to study the characteristics of the neighborhoods that individuals visited during their travels. Third, shortest-path networks (SPNs) measure the minimum distance of routes between locations that individuals have visited and/or the area covered by a buffer around those routes (Schönfelder & Axhausen, 2003). Similar to kernel densities, SPN are better suited for studying travel patterns than for studying neighborhood characteristics of areas that individuals visited.

¹Admittedly, the activity spaces approach does not solve all problems of traditional neighborhood-effects research, and it actually creates some new ones that will be addressed later in this section of the article.

No consensus has been reached about which measure best represents individuals' activity spaces, but one approach to measuring activity spaces that has been gaining traction is the use of the minimum convex hull or polygon (Browning & Soller, 2014; Jones & Pebley, 2014) (see Figure 2d for visualization). To construct a minimum convex hull, the researcher geocodes the geographic coordinates of individuals' residences and the places they visited during a given time; then, with each location used as the vertex, the minimum convex hull (or polygon) is the smallest area with all the destinations points embedded within it. The polygon may be completely inside individuals' residential census units or spread across several census units. Then, activity spaces of individuals are calculated by a reapportioning of the census information. This approach assumes that individuals are exposed to both the places they visit and the areas through which they travel in between those destinations (Jones & Pebley, 2014).

Rather than relying on information from one administratively defined unit, this approach allows researchers to examine individuals' exposure to multiple neighborhoods in terms of their travel patterns.² Although the other, aforementioned measures of activity spaces work best with point data and are best suited to study individuals' travel patterns to different institutions (e.g., health-care facilities), the minimum-convex-hull approach can create an area-based estimation of neighborhood effects.

The advantages of using the minimum convex hull for assessing individuals' activity spaces aside, some limitations do exist. First, because the construction of the polygon requires at least three vertices, rarely visited locations may fail to meet the geometric requirements and thus will be excluded from analysis despite their potential influences. Second, the polygon may include extensive areas beyond the visited locations, which may not be a part of individuals' actual lived activity spaces. Third, the approach does not weight exposures by destinations to capture the time spent in those destinations or the intensity of activity (e.g., through a neighborhood history calendar technique; Axinn & Yabiku, 2001).

Several pioneering studies have investigated the characteristics of activity spaces and how they vary by individual and family characteristics. Some scholars have found that activity spaces are generally larger than individuals' residential neighborhoods as defined by a census tract (Jones & Pebley, 2014; Matthews & Yang, 2013) and that activity spaces are considerably more heterogeneous in terms of key social characteristics than are individuals' residential neighborhoods (Jones & Pebley, 2014; Krivo et al., 2013). For example, segregation levels in work neighborhoods are much lower than in residential neighborhoods (Ellis et al., 2004; Wong & Shaw, 2011). In addition, fewer structural resources exist within the activity spaces of individuals from more disadvantaged neighborhoods (Browning & Soller, 2014). Furthermore, characteristics of activity spaces also vary by individual and family characteristics. The different locations and resources individuals can access depend on individual characteristics, such as individual spatial trajectories and life situations (Kwan, 1999). In an exploratory study of activity spaces in Los Angeles County, Jones and Pebley

²The use of activity spaces approach is not designed to replace the use of administratively defined units, such as census tracts, because the two approaches capture qualitatively different aspects of neighborhoods. The operationalization of neighborhoods should depend on the research question. For example, studying the effects of local resources on families (e.g., exploring how many family counseling resources are in families' local neighborhoods) may dictate the use of administratively defined units.

(2014) found that African Americans have significantly larger activity spaces than Whites and Latinos. Latinos are the most segregated, with activity spaces shared primarily with members of their own racial/ethnic groups. Furthermore, Perchoux et al. (2013) demonstrated that other family characteristics—such as having children at home, being in a marriage or partnership, and the distance from other family members—can influence individuals' activity spaces.

New Opportunities in Family Theory and Research

Although spatial approaches in the social sciences have increased rapidly over the past two decades, especially in neighborhood-effects research, applications of spatial approaches in family studies have been scant. That is, although the concept of family has been central in designing research questions in neighborhood studies, the theoretical and methodological attention devoted to family variables has been limited (Burton & Robin, 2000). Neighborhood-effects research has gained popularity in the past two decades, but the field is faced with both theoretical and methodological challenges. One of the challenges in neighborhood-effects research has been underdeveloped theories, resulting in too many exploratory empirical applications without theoretical guidance (Entwisle, 2007). Attention to families can help the theoretical development of neighborhood-effects research by shedding light on the specific mechanisms through which neighborhoods affect both individuals and families. At the same time, incorporating neighborhood context into family studies can advance family scholarship by putting family into place (Entwisle, 2007), which in turn can contribute to our understanding of the complexity and heterogeneity of families.

The activity-spaces approach captures exposure, the fundamental mechanism of neighborhood-effects research (Browning & Soller, 2014), and it reflects the spatial experiences of individuals in their day-to-day lives. The use of this approach in neighborhood-effects research is still in its infancy (Jones & Pebley, 2014), but it has immense potential for use in family studies. Specifically, the activity-spaces approach can further our understanding of family processes, family behaviors, and family-work balance. First, moving beyond South and colleagues' classic body of work investigating the role of residential neighborhood characteristics in individuals' family transitions (e.g., first-union formation, childbearing) (Crowder & South, 2008; South, 1996, 2001; South & Crowder, 1999), the activity-spaces approach can incorporate the characteristics of the neighborhoods and networks that individuals encounter in their activity spaces. For example, individuals who are exposed to higher potential mate availability in their activity spaces may have a greater probability of making early family transitions than do individuals who have less exposure. Also, individuals who are exposed to different norms about family transitions (e.g., transitions into marriage vs. cohabitation) may choose specific types of family transitions. Similarly, activity spaces can be useful for identifying factors that influence the onset and patterns of adolescents' sexual behaviors, which can have consequences for unintended family transitions. Understanding how activity spaces influence patterns of union formation and dissolution is important because these patterns can influence the family structure and living arrangements of children (Glick, 2010).

Second, activity spaces can help researchers to better understand the relationship between neighborhood characteristics and family behaviors, such as parenting. Previous studies have documented that parenting is closely intertwined with the characteristics of the neighborhoods in which parents are embedded (Pachter et al., 2006; Yonas et al., 2010). For example, positive parenting can fully mediate the negative effects of neighborhoods on adolescents' behavioral problems (Pachter et al., 2006). Instead of using the neighborhood characteristics measured by census tracts, activity spaces can be used to assess the types of social networks that exist within the neighborhoods to which parents are exposed in their day-to-day lives and how individuals learn about parenting norms. For example, an African American parent who resides in a predominantly non-Hispanic White neighborhood may travel outside of the neighborhood to interact with family and friends and may rely on people in his or her daily activity spaces to form his or her parenting norms. In addition, parents in disadvantaged neighborhoods may choose to participate in more activities outside their residential neighborhoods to gain exposure and access to resources from nonresidential neighborhoods.

Third, using activity spaces can better inform family studies researchers about family–work balance because activity spaces may be influenced by the location of the workplace, child care, and other factors. Consistent with this line of thought, Matthews (2011) found that characteristics of mothers' activity spaces are significantly different from characteristics of their neighborhoods as defined by census units. Examining this topic more thoroughly is important for understanding how the choice of approach affects our knowledge of family–work balance and family relationships, especially among working mothers. For example, mothers who work in more affluent neighborhoods may bring some psychological and physical resources back to their less affluent neighborhoods or reduce their neighborhood satisfaction relative to the more affluent neighborhoods. Also, having larger activity spaces because of a long commute to work may increase in family conflict. By using the activity-spaces approach, we can better understand the variations, outliers, and contradictions found in family studies (Coontz, 2015).

On the basis of this review, I offer several suggestions for future studies using the activity spaces approach. First, future studies could define activity spaces in more-nuanced ways by collecting information about which types of activities individuals and families engaged in (e.g., fixed activities vs. habitual or spontaneous activities) (Jones & Pebley, 2014; Perchoux et al., 2013), how often and how much time they spend in each location (i.e., frequency and duration) (Jones & Pebley, 2014), and why they visited each location (McCray & Mora, 2011). To collect more detailed information on individuals' activity spaces, researchers have designed new approaches to collecting data and analyzing complex data. For example, using Global Positioning System (GPS) technology, researchers have started to assess individuals' travel patterns and activities, analyzing them using ecological momentary assessment (EMA) and social network analysis (SNA). These emerging data-collection efforts and methodological advances are steps toward more nuanced research on activity spaces (Browning & Soller, 2014). By collecting such nuanced and in-depth information, family studies researchers will be able to understand how multiple family members' experiences in and exposures to neighborhoods differ and how they affect individuals and families.

Second, future studies might investigate how individuals' perceptions, mobility, and family contexts can influence activity spaces. Individuals' definitions and perceptions of their neighborhoods vary significantly, and these subjective perceptions may influence the locations and resources that individuals and families access (Colabianchi et al., 2014). Also, as mentioned earlier, increasing complexity in family structure and dynamics exposes individuals and families to multiple neighborhood contexts, and exposures to multiple neighborhood contexts may help elucidate how neighborhoods matter for individuals and families.

Third, the activity-spaces approach and neighborhood-effects research in general need to expand their scope by considering protective factors in neighborhoods, given that most research has focused on the negative effects of neighborhoods (e.g., Sharkey, 2006). For example, individuals and families from a disadvantaged neighborhood may be able to tap into certain neighborhood advantages by traveling to or through affluent neighborhoods.

Fourth, future studies that use qualitative approaches of geo-ethnographic methods, such as in-depth interviews and participant observation, could capture the subjective understanding of activity spaces and provide a more comprehensive understanding of individuals' and families' neighborhood and activity spaces (Kwan, 1999; Matthews, Detwiler, & Burton, 2005). This approach can also help elucidate whether, how, and why multiple family members' experiences and outcomes may differ despite the fact that they share the same residential neighborhood.

Finally, more systematic attention to the diversity of families and how multiple contexts can interact with activity spaces would enhance neighborhood-effects research. For example, undocumented immigrant families may limit their activity spaces in fear of deportation, and their limited activity spaces may protect them from neighborhood disadvantages but may also deprive them of neighborhood resources. Incorporating diversity of families across multiple dimensions (e.g., race/ethnicity, class, immigration status, legal status, sexual orientation) should be carefully considered in using activity spaces approach to understand individuals and families. That is, more systematic attention to the diversity of families, as well as to the interaction of multiple contexts with activity spaces to influence individuals and families, can highlight the intersection of families and places.

In conclusion, family studies has much to contribute to developing better theories of neighborhood effects and elucidating the specific mechanisms through which neighborhoods affect individuals. The concept of activity spaces from neighborhood-effects research also has much to offer family studies both theoretically and methodologically. In addition, the methodological innovation of the activity-spaces approach provides an exciting opportunity to move toward transdisciplinary family sciences (Blume, 2014) and guide prevention and intervention efforts with children and families. For example, in cases of child problem behaviors, incorporating activity spaces can better identify potentially modifiable mediators of neighborhood contexts. Information regarding where individuals and families spend their time can be used to design more effective prevention and interventions specific to the needs of families in certain neighborhoods (Burton & Robin, 2000). In addition, policy makers and researchers could use an activity-spaces approach to identify spatially entrapped individuals

and families in an effort to increase their accessibility of resources (e.g., health-care infrastructure, family resource centers) (Matthews & Yang, 2013).

Facilitating more discussion and an incorporation of the activity-spaces approach in family studies will require more effort devoted to data collection and training. The underutilization of neighborhood contexts in family studies is largely due to data constraints; data sources used in family studies typically do not contain the appropriate geographic information (e.g., addresses) for investigating neighborhoods. Although data increasingly include addresses of individuals' residences, which allow researchers to use census units as proxies for individuals' neighborhoods, the field needs more data containing detailed information about the places people visit regularly. In addition, because the construction of activity spaces requires extensive computation skills using GIS, additional training for family scholars is needed. With more effort in data collection and training, the activity spaces approach can provide exciting new opportunities for family scholars to explore the complexity and heterogeneity of families across time and space.

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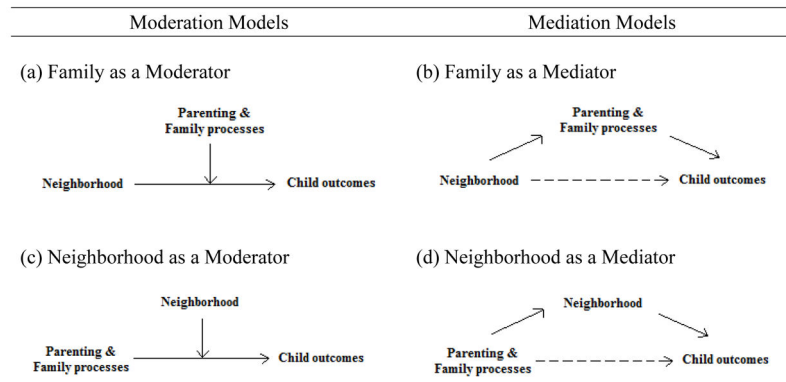


Figure 1.
Moderating and mediating mechanisms in neighborhood-effects research.

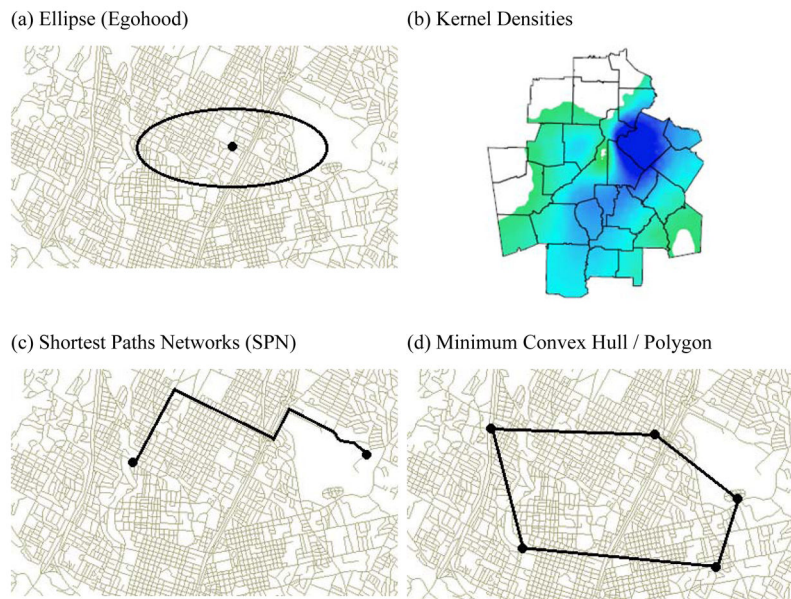


Figure 2.
Various measures of activity spaces.

Table 1

Inferential Errors Resulting From the Uncertain Geographic Context Problem

True state of contextual effects	Observed state of contextual effect	
	Had effect	No effect
Has effect	<ul style="list-style-type: none"> • Contextual units correct • Correct inference 	<ul style="list-style-type: none"> • Contextual units incorrect • False negative findings (obscured contextual effect)
No effect	<ul style="list-style-type: none"> • Contextual units incorrect • False positive findings (spurious association) 	<ul style="list-style-type: none"> • Contextual units correct • Correct inference

Source. Kwan (2012), Table 1.