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George Galster, Patrick Sharkey

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Spatial Foundations of Inequality: A Conceptual Model and Empirical Overview

GEORGE GALSTER AND PATRICK SHARKEY

Inequalities among individuals and households in achieved socioeconomic status (income, wealth, and so on) in the United States have reached levels not observed for almost a century. We believe that a corresponding evolution of geographic inequalities in socioeconomic, environmental, institutional, and political domains both reflect and—more importantly from our perspective—contribute to these inequalities across individuals.[1] It is this belief that motivated the Russell Sage Foundation to devote an issue of *RSF: The Russell Sage Foundation Journal of the Social Sciences* to this topic.

Our primary purpose in this introductory article is to develop a holistic, multilevel conceptual model for comprehending how space can be considered a foundation of U.S. socioeconomic inequality. Our secondary aim is to provide a synthetic review of the evidence on various dimensions of inequality of opportunity and outcomes in America, and the empirical scholarly literature that provides plausibly causal estimates of the impact of space on individual socioeconomic outcomes. We do not advance new empirical research but rather a framing of the issues that will be sufficiently robust and comprehensive to permit integration of all the papers in this issue as illustrations and amplifications. Moreover, we hope that our model will be useful in generating hypotheses and thereby stimulating further research on this crucial topic.

In overview, our conceptual model contends that the variations in geographic context across multiple scales (neighborhood, jurisdiction, metropolitan region)—what we call *spatial opportunity structure*—affects the socioeconomic outcomes that individuals can achieve in two ways by altering the payoffs that will be gained from the attributes individuals have during any given period and the bundle of attributes that individuals will acquire (both passively and actively) during their lifetimes.

In the first mechanism, the spatial opportunity structure serves as a mediating factor,

George Galster is Clarence Hilberry Professor of Urban Affairs at Wayne State University. **Patrick Sharkey** is professor of sociology at New York University.

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1. We are not the first to make such claims, of course. A similar theme is advanced in numerous seminal works (for example, Wilson 1987; Jencks and Mayer 1990; Brooks-Gunn et al. 1993; Briggs 1995; Brooks-Gunn, Duncan, and Aber 1997).

translating a given bundle of individual attributes into achieved status depending on geography of the individual's residence, work, and routine activity spaces. In the second mechanism, the spatial opportunity structure serves as a modifying factor affecting the bundle of attributes that individuals develop over time in three ways. First, it directly influences the attributes over which individuals may exercise little or no volition, such as exposure to environmental pollutants or violence. Second, it directly influences the attributes over which they exercise considerable volition by shaping what they perceive is the most desirable, feasible option. It does so by influencing what information about the individual's options is provided, what the information objectively indicates about payoffs from these options, and how the individual subjectively evaluates the information. These decisions early in life lead people into various path-dependent trajectories of achieved socioeconomic status and subsequent life decisions, in cumulatively reinforcing processes that can stretch across lifetimes and generations. Third, in the case of children and youth, the spatial opportunity structure indirectly influences their attributes through induced changes in the resources, behaviors, and attitudes of their caregivers.

INEQUALITIES IN THE SPATIAL OPPORTUNITY STRUCTURE

The first basic claim that motivates this issue is that various dimensions of inequality are organized in space. The spatial organization of inequality is, in part, simply a manifestation of inequality occurring at the level of individuals, families, and groups that is mapped on to spaces. However, spatial inequality also is due to intentional efforts to organize physical space in ways that maintain or reinforce inequality (Dreier, Mollenkopf, and Swanstrom 2001). As a result of both sets of processes, variation is tremendous in economic status, labor market opportunities, core institutions such as schools, environmental hazards, and social networks across city blocks, neighborhoods, cities and towns, metropolitan areas, and regions. We begin with a descriptive portrait of several different dimensions of the spatial opportunity structure, focusing on the distribution across space of different segments of the population as classified by racial-ethnic background and income, economic opportunities, environmental hazards, and violence.

Segregation by Economic Status and Race-Ethnicity

Trends in household income and wealth inequality, which have been well documented in academic work and the popular press, are mirrored by trends in the degree to which low- and high-income families live apart from each other, as measured by economic segregation (Bischoff and Reardon 2014; Jargowsky 1996, 2003, 2015; Reardon and Bischoff 2011, 2016; Watson 2009). No matter how economic segregation is measured, trends show steady growth in the degree of segregation by income since the 1970s. Sean Reardon and Kendra Bischoff (2016) use a straightforward measure of the proportion of families living in neighborhoods that have median income at least 50 percent above or 50 percent below the metropolitan area median to document changes in the degree to which American families have begun to sort into separate communities stratified by economic status. They find that, in 1970, about 15 percent lived in neighborhoods that were either extremely affluent or extremely poor. By 2012, that figure had risen to 34 percent.

Although the growth of affluent neighborhoods is an important contributor to the rise of economic segregation (Reardon and Bischoff 2011), much of the concern about the issue stems from the long-term rise of concentrated poverty. Paul Jargowsky (2003, 2015) documents trends in the proportion of all Americans and poor Americans living in neighborhoods with a poverty rate of 40 percent or greater in a series of reports, showing substantial growth in concentrated poverty from 1970 to 1990, a decline of high-poverty neighborhoods in the 1990s, and a subsequent increase in concentrated poverty from 2000 to the most recent years in which data were available (from 2009 through 2013). Since 2000, the number of extreme poverty neighborhoods has risen by more than 75 percent and the number of Americans living in such neighborhoods by more than 90 percent, from 7.2 million to 13.8 million (Jargowsky 2015).

Economic inequality in American neighborhoods overlaps with persistent racial and ethnic inequality. Residential segregation of African Americans from Anglo Americans is most commonly measured two ways: the dissimilarity index, which captures the comparative evenness of the overall distribution of two racial or ethnic groups across the neighborhoods of a city or metropolitan area, and the isolation index, which captures the degree to which members of a particular racial or ethnic group live in neighborhoods occupied by members of the same group.[2] According to both measures, the segregation of blacks from whites continues to be extremely high in many urban areas, although black-white segregation has declined steadily since 1970 (Glaeser and Vigdor 2012; Logan and Stults 2011; Logan, Stults, and Farley 2014). Measures of evenness in the distribution of both Hispanics and Asian Americans relative to whites show slight increases in the level of segregation over time, whereas measures of their isolation show larger increases over time, consistent with the rapid population growth of both groups (Logan 2011).

Beyond the separation of racial and ethnic groups from one another is the question of the average economic status in the neighborhoods of each group. Economic segregation within racial and ethnic groups has been rising over time, particularly for black and Hispanic families since 2000 (Bischoff and Reardon 2014). This trend has led to more inequality within groups; however, between-group inequality continues to be extreme. Jargowsky (2015) shows that roughly five million blacks live in neighborhoods with poverty rates of at least 40 percent, a figure that is higher than any other racial or ethnic group. Among the poor, 25 percent of blacks live in concentrated poverty, versus 7 percent of poor whites and 17 percent of poor Hispanics. These figures reflect a broader set of findings in the literature demonstrating that different racial and ethnic groups continue to live in highly unequal residential environments than other groups even after accounting for group differences in economic status. The gaps are most notable when blacks and whites are compared. In all urban areas across the country, Patrick Sharkey (2014) finds that black families with household income of $100,000 or more live in and are surrounded by neighborhoods with higher levels of disadvantage than white families with income of $30,000 or less (see also Logan 2011; Reardon, Fox, and Townsend 2015).

Schools and School Districts

The research described in the previous section indicates that inequality in residential environments (especially in its economic composition) has been growing for all American families. These same trends are amplified for families with children. Evidence using several measures of racial and economic segregation shows that households with children are distributed less evenly across neighborhoods of different racial-ethnic composition and economic status, respectively, than are households without children (Logan et al. 2001; Jargowsky 2015; Owens 2016). The relatively high level of residential segregation among children has important implications for schooling and academic achievement.

Trends in economic segregation in schools are not as clear as trends in residential segregation by income, mainly because of the absence of precise data on student economic status in schools across the country (Reardon and Owens 2014). Research using student eligibility for free lunch as a proxy for low economic status has documented trends from 1990 to 2010, and found growing segregation of low-income students between school districts within the same urban area, and growing segregation of low-income students between schools within the same district in the 1990s but not the 2000s (Owens, Reardon, and Jencks 2016). An alternative approach focuses on the overall population of families living within school districts (available from 1970) or on families with children in public schools (available since 1990).

2. The exposure index also is used frequently, but this measure is essentially the opposite of the isolation index and is designed to capture the degree to which members of a particular group are exposed to members of another group in their neighborhoods.

Using this approach, trends in the degree of segregation between school districts are largely consistent with the trends in economic segregation across neighborhoods. Economic segregation between school districts rose for all families in the 1970s and 1980s, and continued to rise for families with children in public schools in the 1990s and 2000s (Owens, Reardon, and Jencks 2016).

Levels and trends in school racial segregation are more difficult to summarize. From the late 1960s through the end of the 1970s, the segregation of black and white students within school districts, measured by evenness and exposure, declined substantially (Reardon and Owens 2014). However, segregation between school districts rose, particularly in the north. Since 1980, exposure of black students to white students has fallen (Orfield and Lee 2007), a pattern largely explained by the fact that the population of students in the United States has grown more diverse over time. Focusing on evenness, trends in black-white school segregation depend on the exact time frame under study, but most studies report modest increases since 1980 (Reardon and Owens 2014).

Jobs and Economic Opportunities

Early research on spatial inequality in access to jobs focused on the shift of employment opportunities away from central cities and into the suburbs, arguing that changes in urban economies had contributed to growing racial gaps in joblessness and welfare receipt (Kain 1968; Wilson 1987). In putting forth his spatial mismatch theory, John Kain (1968) argued that the combination of racial segregation, group variation in skills and human capital, discrimination in the labor and housing markets, and lack of access to employment networks and employment opportunities helped explain the relatively high rates of joblessness among black Americans in central cities. Subsequent research by William Julius Wilson (1996) focused on the growth of joblessness as a primary explanation for a set of changes and deteriorating conditions in high-poverty, central city neighborhoods.

Descriptive evidence generally supports the argument that spatial proximity to jobs contributes to racial and ethnic disparities in joblessness and economic status (Holzer 1991; Kain 1992). However, the original focus on the location of jobs in central city versus suburban areas applied primarily to large urban centers in the Northeast and Midwest (Ihlanfeldt and Sjoquist 1998). Judith Hellerstein, David Neumark, and Melissa McInerney (2008) argue for a more refined perspective that focuses on the importance of access to jobs held by black Americans, particularly those held by blacks with the same level of education. The overall prevalence of jobs is shown to be less important than the prevalence of jobs held by other blacks, suggesting that discrimination and employment networks may be more relevant than the raw presence of jobs in explaining racial gaps in employment (see also Hellerstein, Kutzbach, and Neumark 2014; Waldinger 1996).

Recent research focuses on spatial inequality in wages, well-paid jobs, and economic growth across urban areas. From 1980 to 2010, metropolitan areas that initially had high shares of college-educated workers have experienced greater growth and demand for well-paid workers, leading to growing inequality across metropolitan areas over time as the returns to college education have grown and urban economies have become increasingly bifurcated (Lindley and Machin 2014). Two sets of consequences have arisen. On the one hand, inequality between cities and metropolitan areas has grown as employment opportunities have shrunk absolutely and real wages have stagnated or fallen in places that are geographically and economically isolated from high-demand global cities. On the other hand, inequality within high-demand urban areas has widened as the growing returns to higher education have created widening gaps between highly educated and less-educated workers (Florida 2010).

An additional strand of evidence documents geographical variation in economic mobility across commuting zones (sets of contiguous counties that surround central cities and cover the entire nation), using data from tax records for all Americans over time. Raj Chetty and colleagues (2014) show that a single, national measure of economic mobility or persistence obscures the tremendous variation across regions of the United States and across

specific commuting zones. Subsequent research exploiting sibling differences in time spent in low- and high-mobility commuting zones suggests that places themselves have causal effects on the probability of upward mobility, although less progress has been made in identifying characteristics of places that facilitate or impede upward mobility (Chetty and Hendren 2015).

The idea that places exert independent effects on the economic outcomes of residents receives further support from recent research focusing on the magnitude of the employment shock experienced by local areas during the Great Recession. Danny Yagan (2016) compares workers at the same level and in the same retail firm but located in areas of the country that were hit more or less hard by the economic downturn that began in 2008. Workers in areas hit harder by the recession were 1 percentage point less likely to be employed in 2014, several years after the recession had ended.

Environmental Hazards

In the 1980s, attention began to be focused on the siting of environmental hazards in communities across the country, revealing a pattern in which hazardous waste sites were disproportionately located in communities occupied primarily by racial and ethnic minority groups (Bryant and Mohai 1992). Since that time, research has proliferated on spatial variation in air pollution, environmental toxins like lead, siting of manufacturing plants, and the location of chemical accidents and hazardous waste.

This research has found consistent evidence that, within most metropolitan areas, different forms of environmental hazards are more common in low-income communities and in communities of color, though the degree of inequality by economic status and race-ethnicity varies depending on the specific type of hazard under study. Liam Downey and Brian Hawkins (2008) analyze variation in the concentration of air pollutants released from industrial facilities by neighborhood racial-ethnic composition and income; they find that black Americans live in neighborhoods with concentrations of toxic releases 1.45 times greater than those in white neighborhoods and 1.7 times greater than in Hispanic neighborhoods. The greater exposure of blacks to air pollution is particularly pronounced for very low-income blacks compared with their white and Hispanic counterparts, but is present at every level of income. Downey and Hawkins show that, just as middle- and upper-income black Americans live in neighborhoods with levels of disadvantage comparable to poor whites, black households with income equal to or greater than $50,000 live in neighborhoods with more air pollution than white households making less than $10,000 per year.

Although racial and economic gaps in exposure to environmental toxins are present at the national level, Downey (2007) documents tremendous variation in the degree of environmental inequality across U.S. metropolitan areas. In some urban areas, black and Hispanic residents are exposed to much higher levels of environmental hazards than whites, while in others there is no disparity. Even as more attention has been paid to pollution and environmental hazards, racial and ethnic gaps have persisted. Kerry Ard (2015) analyzes air pollution from 1995 to 2004 and finds sharp declines in average levels of pollution over time nationally, although declines in central cities were less pronounced. However, the gap in exposure to air pollution between blacks and whites has not changed over time, suggesting the persistent, important role of geography.

Persistent racial and ethnic gaps in exposure to environmental toxins relate closely to a large literature on inequality in health and well-being, which is reviewed elsewhere (Diez-Roux and Mair 2010; Kawachi and Berkman 2003; Sampson 2003). Recent research documents spatial variation in especially harmful toxins, notably lead. At the county level, Paul Stretesky (2003) documents an association between the percentage of black children and air lead concentrations. The few studies conducted at the neighborhood level in specific places document similar links between racial composition and elevated blood lead levels (for example, Lanphear et al. 1998). Robert Sampson and Alex Winter (forthcoming) use detailed data from Chicago children measured from 1995 to 2013 to track changes in elevated blood lead levels in block groups across the

city, documenting enormous gaps in elevated blood lead by race and ethnicity in the mid-1990s; in some predominantly black neighborhoods, more than 90 percent of tested children had elevated levels of blood lead. These rates, however, dropped precipitously over the period for all groups. Although black and Hispanic neighborhoods continued to have higher rates of elevated blood lead, prevalence was well below 10 percent in all communities by the end of the period under study. Sampson and Winter argue that the patterns reveal both the enormous spatial disparities in exposure to environmental toxins as well as the power of public health intervention to reduce or eliminate the consequences of environmental inequality.

Violence

Among the developed nations of the world, the United States has a relatively high violent crime rate and an extremely high homicide rate (UNODC 2013). However, the national rate of homicides obscures the variation in the prevalence of violence across cities and neighborhoods. Whereas many cities are remarkably safe, cities such as St. Louis, Detroit, and Baltimore have homicide rates that rival the most violent, war-torn places in the world (Federal Bureau of Investigation 2015). Within cities, violent crime is unevenly distributed across neighborhoods. For example, in a city like Chicago with a high average violent crime rate, some communities in the northern part of the city are largely untouched. In the neighborhoods of the city's south and west sides, however, violence is concentrated in communities characterized by poverty, ethnic isolation, and institutional decay (Papachristos 2013; Sampson 2012).

The spatial concentration of violence is not unique to Chicago. Research from cities with low or average crime rates, such as Seattle and Boston, shows that a disproportionate share of violent crime takes place within a few city blocks and street segments (Braga, Papachristos, and Hureau 2010; Braga, Hureau, and Papchristos 2011; Weisburd et al. 2004).

A growing strand of evidence suggests that violence may be one of the central mechanisms by which growing up in a disadvantaged neighborhood affects the life chances of children (Sharkey and Sampson 2015). However, violent crime is one of the few dimensions of spatial inequality that has changed in a positive way over time. Over the past twenty years, the national rates of violent crime and homicide have roughly halved. The cities with the highest rates of violence in the 1990s, which had disproportionately high prevalence of racial and ethnic minority populations and high levels of poverty, have seen the greatest declines in violent crime since then (Ellen and O'Regan 2009).

Only limited evidence is available on trends in crime at the level of neighborhoods. Michael Friedson and Sharkey (2015) draw on data from six cities where it is possible to track neighborhood-level trends in crime over at least a decade, and find that the greatest absolute declines in violent crime occurred in the most violent neighborhoods. In four of the six cities, the relative decline of violence was also largest in the cities' most violent neighborhoods; in the remaining two, the proportional decline of violent crime was roughly equivalent in the most violent neighborhoods and in the rest of the cities. In these six cities, the trends mean that the level of inequality in community violent crime has declined over time, though it remains severe. The degree to which poor and nonpoor residents, and white and nonwhite residents, are exposed to violent crime in their neighborhoods has converged.

An Interim Summary

Our first claim in this paper is that various dimensions of inequality are organized in space. We review available evidence and document the degree of spatial inequality in economic status, access to well-paid jobs, exposure to environmental hazards, and exposure to community violence. We find that spatial inequality frequently is overlaid with racial and ethnic segregation of neighborhoods and schools. Where possible, we track changes over time in spatial inequality, and show that neighborhood economic segregation, concentrated poverty, ethnic residential segregation between whites and both Hispanics and Asians, and economic and ethnic segregation of schools have risen over time. By contrast, racial resi-

dential segregation between whites and blacks and spatial inequality in community violence have declined.

This review suggests that the fault lines for spatial inequality may be gradually shifting in the United States. Whereas the peak of racial segregation, joblessness, and violent crime may have passed several decades ago, the rise of economic segregation may suggest that economic status will become an increasingly important dimension of urban inequality. Further, the focus on trends in spatial inequality should not distract from the finding that U.S. neighborhoods continue to feature severe levels of racial, ethnic, and economic segregation and high levels of inequality in violence, environmental hazards, and other features of communities thought to be most directly linked to the life chances of residents. In the following section, we present a conceptual model designed to explain the processes and mechanisms behind the causal effect of such unequal places on individuals' socioeconomic opportunities.

A MODEL OF HOW VARIATIONS IN THE SPATIAL OPPORTUNITY STRUCTURE GENERATE INEQUALITIES IN INDIVIDUALS' ACHIEVED SOCIOECONOMIC STATUS

We are interested in understanding how the space or spaces in which individuals are embedded influences their socioeconomic outcomes. We conceptualize this aspect of space as *spatial opportunity structure*, the panoply of markets, institutions, services, and other natural and human-made systems that have a geographic connection and play important roles in people's socioeconomic status achievements.[3] The spatial opportunity structure includes labor, housing, and financial markets; criminal justice, education, health, transportation, and social service systems; the natural and built environment; public and private institutional resources and services; social networks; forces of socialization and social control (collective norms, role models, peers); and local political systems. By achieved socioeconomic status here we mean earnings, wealth, and occupational attainment.

Various elements of the spatial opportunity structure operate at and vary across spatial scales, as demonstrated. This variation occurs across at least three distinct scales. Across neighborhoods, variations in safety, natural environment, peer groups, social control, institutions, social networks, and job accessibility occur. Across local political jurisdictions, health, education, recreation, and safety programs vary. Across metropolitan areas, the locations of employment of various types and associated wages, working conditions, and skill requirements vary and housing and other market conditions that affect individuals' opportunities for advancement differ.[4]

We view the spatial opportunity structure as affecting socioeconomic outcomes via *structuring opportunity* both directly and indirectly. It directly affects how, during a given span of time, a given set of personal attributes will pay off in terms of socioeconomic status achievements. The spatial opportunity structure indirectly affects over a longer span the set of attributes individuals bring to the opportunity structure. Some of these indirect effects require little or no individual volition to acquire, such as aspects of mental and physical health that may be passively acquired merely by living in the natural, built, and social environment and collective norms and local networks that influence what information people receive and how they evaluate it. In the case of children and youth, other indirect effects transpire through influences on the caregivers that affect the resources and parenting behaviors brought to bear in the household. A final indirect effect occurs by molding individual volition involved in decisions related to education, risky behaviors, marriage, fertility, labor force participation, illegal activities, and sociopolitical participation. Decisions regarding these domains are so crucial in determining socioeconomic

3. Similar notions of *opportunity structure* and *geography of opportunity* were first introduced by George Galster and Sean Killen (1995).

4. Of course, within any of these three scales contextual variations in all noted domains are entirely possible.

outcomes in our society that we label them *life decisions.* In the following section, we amplify and illustrate these concepts and relationships with the aid of a heuristic visual model.

A Heuristic Model of Achieved Socioeconomic Status

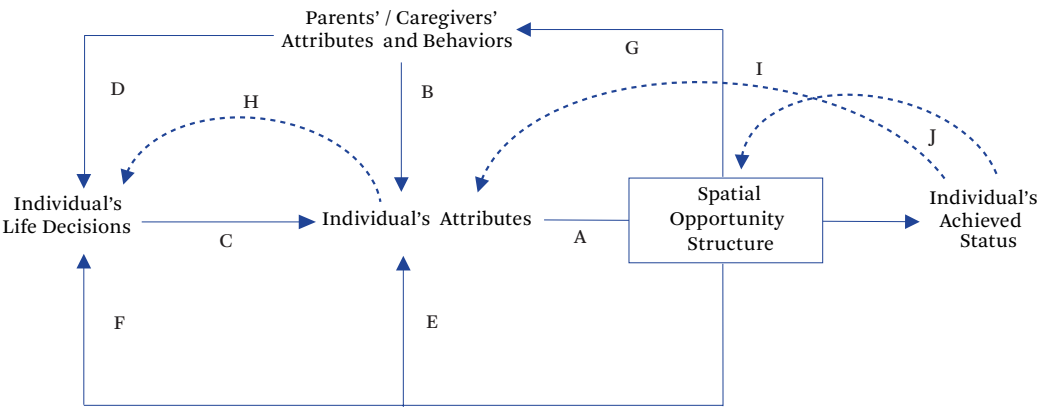
A visual model of our conceptual framework for understanding how space provides a foundation for inequalities in achieved status is presented in figure 1. To begin with the most basic and obvious relationship, an individual's attributes will play a fundamental role in producing markers of achieved socioeconomic status; this is represented by path A in figure 1. If the individuals in question are adults, we would expect that interpersonal variations in their current bundles of achievement-influencing attributes would explain substantial variation in their contemporaneously measured achieved socioeconomic status; in the case of children, current attributes would be predictive (though less precisely) of future achieved socioeconomic status at some point or points as adults. Some personal characteristics are essentially fixed over the lifetime of the individual, inasmuch as they are associated with the vagaries of conception and birth. Such fixed attributes would include, for example, genetic signature, place and year of birth, and many (though not all) characteristics of the individual's parents and ancestors. Other personal characteristics are (potentially) more malleable over a lifetime. Some may be acquired passively, such as through child-rearing activities of one's parents, as is portrayed in path B in figure 1. Other malleable attributes will be the product of previous decisions and actions by the given individual even though, once acquired, may no longer be malleable; this is portrayed as path C in figure 1. Some decisions—our life decisions just mentioned—are especially important in establishing a trajectory for achieved status outcomes.[5] These include actions related to employment, crime, child-rearing, cognitive and vocational skills, educational credentials, smoking, drinking, substance abuse and other aspects of health, and social networks. Of course, the norms, aspirations, information, and resources individuals bring to bear in a particular life decision-making situation is substantially influenced by multiple inputs supplied by their parents or caregivers, both currently and perhaps previously in their lives, as represented by path D in figure 1.

Spatial Opportunity Structure as Mediator Between Personal Attributes and Achieved Status

At this point in our exposition, we take all these fixed and malleable attributes as predetermined so we can isolate one crucial role played by the space where the individual is currently embedded. We posit that the spatial opportunity structure serves as a *mediator* between individuals' current characteristics and their socioeconomic status outcomes (see path A in figure 1). Because the spatial opportunity structure varies dramatically across and within metropolitan areas in the ways that it evaluates personal attributes in the process of translating them into achieved status, one's chances for such achievements will be enhanced or eroded depending on place of residence, work, and routine activity space. Several illustrations make our point. Metro areas with labor market actors that are more prone to discriminate on the bases of gender or ethnicity against those who have decided to apply for jobs will diminish the expected socioeconomic payoffs from

5. We recognize the voluminous literature on human decision-making and considerable debate over the most appropriate model (see review in Galster and Killen, 1995). We think it irrelevant for our model which particular view is taken, so long as one rejects the notion that these choices are purely instinctual or random, having no relationship with the social construction of a current and prospective reality. We think these choices may generally be described as based on *bounded rationality*: imperfect (perhaps even incorrect) information, subjective assessments, and varying degrees of dispassionate, analytical thought versus impulse and snap judgments contingent on personal context. Though our model has many features in common with the "rational actor" model of Erikson and Jonsson (1996) and Becker (2003) we stress that socio-spatial context is a prime source of information and values related to an individual's assessments of expected benefits and costs.

Figure 1. Conceptual Framework



Source: Authors' compilation.

whatever attributes women and ethnic minorities bring to the workplace. Even the most attractive attributes from an employer's perspective may not yield a high income if the potential employee lives far from potential workplaces and cannot find a suitably fast and reliable form of commuter transportation. Underresourced, poorly administered schools with weak teachers and a cadre of disruptive, violent peers will be less likely to leverage students' curiosity and native intelligence into literary and numerical competence and, ultimately, marketable educational credentials for those who have decided to get a diploma. Those with little to no work experience may find that neighborhoods dominated by illegal or underground markets will favorably evaluate some of their attributes (such as present orientation, predilection for violence) that were discounted in mainstream labor markets. Women living in neighborhoods dominated by patriarchal norms and collective socialization into rigid gender roles will be less able to convert even the most productive personality attributes and educational credentials into socioeconomic achievements in the larger society.

Spatial Opportunity Structure as a Modifier of Personal Attributes

As potent as the effects of the spatial opportunity structure as mediator may be, we think an often-overlooked yet powerful influence is exerted in three distinct ways through the passive and active acquisition or modification of personal attributes over time. First, through environmental exposure, it directly influences some attributes of individuals over which they may exercise little or no volition. Second, it directly influences the attributes of individuals over which they exercise considerable volition by shaping what they perceive is the most desirable, feasible option in the process of making life decisions. Third, in the case of children and youth, the spatial opportunity structure indirectly influences their attributes through induced changes in the resources, behaviors, and attitudes of their caregivers. Diagrammatically, we now turn our attention to paths E, F, and G portrayed in figure 1.

Personal attributes are constantly being molded by the physical and social environments in which a person lives, even if such molding has not been consciously chosen and may be unobserved by the individual; this is represented by path E in figure 1. Several examples for the physical and social scientific literature illustrate our point. We know, for example, how variations in air pollution can be associated with a range of health outcomes (McConnell et al. 2010; Lovasi et al. 2011). Lead associated with neighborhoods with older housing stock has been shown to cause perma-

nent damage to children's cognitive functions and attention spans (Rau, Reyes, and Urzúa 2013). Exposure to violence (both as a victim and witness) creates physical, mental, and emotional responses that, among other things, have been shown to interfere with academic performance (Sharkey 2010; Sharkey et al. 2012, 2015). Neighborhood or school-based peers, role models, and other collective socialization forces can shape one's norms, preferences, aspirations, and behaviors.

As noted, an individual's attributes are also modified as a result of the individual's actions. Of primary importance for achieved status is what we termed life decisions. The spatial opportunity structure affects such decisions by shaping individuals' perceptions of what is the most desirable, feasible course of action; this relationship is portrayed in path F in figure 1. These decision-shaping effects of the spatial opportunity structure are transmitted by influencing: what information about the individual's options is provided, what the information objectively indicates about payoffs from these options, and how the information is subjectively evaluated by the individual. Local networks can affect the quantity and quality of information that an individual can access regarding the opportunity set. The notion of social isolation associated with minority neighborhoods of concentrated disadvantage (Wilson 1987) is illustrative. The collective norms operating within these networks can also shape which media of information transmission are considered more reliable sources of data about the opportunity structure. Neighborhood or school-based peers, role models, and other collective socialization forces can shape a person's norms and preferences, thereby altering the perceived prospective payoffs associated with various life decisions.

Finally, the spatial opportunity structure indirectly affects the attributes children and youth will exhibit by shaping the resources, attitudes, health, and parenting behaviors of their adult caregivers; this portrayed as path G in figure 1. In our discussion of paths E and F, we describe the various mechanisms of how spatial context can affect a person's attributes; our point here is simply to note that when such persons happen to be caregivers they become the medium through which the impacts of the spatial opportunity structure are transmitted to those under their care. As illustration, evidence is ample that the health (mental and physical) and resources (economic and social) of parents have a profound effect on how children develop in multiple domains (Haveman and Wolfe 1994). Thus, should the spatial opportunity structure have an impact on any of these domains through any of the causal processes modeled, the indirect causal link to the succeeding generation will be made. A variant of this connection is that caregivers have been observed to alter their parenting styles in response to their perceptions of the spatial context in which their children must operate (Galster and Santiago 2006).

Feedback Effects

To complete our conceptual model we consider several feedback effects (see dotted lines in figure 1). Once a particular life decision has been made, the associated attribute becomes part of the individual's "résumé" (path H in figure 1). This change in the portfolio of attributes will affect the individual's opportunities in the future, perhaps irreversibly, depending on the life decision in question. Certainly the acquisition of educational credentials provides a lifelong change in one's feasible set of opportunities; so does being convicted of a felony. Less obviously, prior life decisions may reshape individuals' aspirations, preferences, and evaluative frames. For example, a decision to raise children may intensify aversion to risky entrepreneurial ventures or participation in illegal activities. Similarly, if choices to seek long-term employment have consistently been frustrated, willingness to invest in human capital development for the future and respect for civil authority may wane, leading to a reevaluation of feasible options in the opportunity set. A decision to participate in gang activities may expose those individuals to different attitudinal and aspirational norms that likely alter their assessments of many options in life decision set.

What one has achieved at a given moment in terms of markers of socioeconomic status (income, wealth, and occupation) also generates two feedback effects. The first is that the

degree of achieved status shapes the bundle of attributes the person will develop in the future by altering the degree of financial constraint on obtaining certain attributes (path I in figure 1). For example, greater accumulated wealth by a certain time in life permits people henceforth to buy superior training and credentials, maintain better health and free themselves from constraints on employment by offloading some child-care responsibilities on to hired caretakers. One will be exposed to different sources of information, collective norms, peer effects, and role models in the workplace depending on occupation.

Finally, and perhaps most fundamentally, achieved status affects what spatial opportunity structure one confronts (path J in figure 1). Clearly, for most households in the United States that do not receive subsidies for housing, their residential location and associated characteristics of the spatial opportunity structure will depend on their ability to pay for housing. Residential sorting on the bases of income and wealth is to be expected in an economy in which the market performs the main resource allocation functions. Other exposures to the spatial opportunity structure (via interfaces with schools, transportation systems, retail shopping, and workplaces) are similarly molded by ability to pay for products and services. Households with the greatest financial means select what they perceive as the most desirable niches in which to live and undertake their routine activities, which are ceteris paribus the most highly priced. The financial exclusivity of these spaces can be abetted by a variety of zoning codes and other development restrictions if the well-heeled can politically dominate a local jurisdiction to serve their interests. At the other extreme, households with little to no market power are relegated by default to the least expensive, residual pockets of the spatial opportunity structure: slums, ghettos, and the streets.

Cumulative Causation and Path Dependencies

This model should make it obvious that we view the processes involved in achieving socioeconomic status as cumulative, path dependent, and (typically) mutually reinforcing over time. One's stock of attributes measured at any given time will be shaped by the niche or niches of the spatial opportunity structure they have experienced in the past, both directly and indirectly through its influence on previous life decisions and actions by caregivers. Going forward, this set of attributes will constrain (to a greater or lesser extent depending on the attribute bundle and past socioeconomic achievements) the perceived life decision options and associated expected payoffs. By way of illustration, a person who has dropped out of high school and served jail time for being convicted of a felony will have far fewer options in the future for socioeconomic status achievements than a person who has a graduate degree and no brushes with the law; and expected financial payoffs associated with any similar life decision options they share (such as working full time) will differ significantly. These differences in opportunities will in turn lead both people down different paths of sequential life decisions in the future. Abetting this mutually reinforcing sequence of decisions over the life course is the financial effect on what parts of space one can afford to access. Those whose paths have resulted in substantial achievements in status early in life can afford to occupy more privileged niches later on, providing themselves and their offspring with even better attributes and opportunities, which in turn will spawn even more productive life decisions.

Evolution of the Spatial Opportunity Structure

This description has taken the housing market, a prime driver of the spatial opportunity structure, as given. From the perspective of an individual decision-maker, the assumption is reasonable. From a longer-term, general equilibrium perspective, the housing market in particular and the spatial opportunity structure in general is constantly evolving, partly in response to how the population has been sorting themselves as housing demanders across the metropolitan area. As documented earlier, this sorting process has produced a considerable racial and economic segregation and wide variations in many other contextual indicators. It is beyond the scope of this model to consider

all these forces shaping the spatial opportunity structure; a few illustrative comments are in order regardless.

Some of the alterations in the spatial opportunity structure may be exogenous to households, such as a technologically or international trade-induced industrial restructuring. Other alterations, however, may be influenced by the aggregate behaviors of households within a metropolitan area that have been produced by a previous period's opportunity structure. For example, the poor quality of the local public school system serving a neighborhood may constrain children's ability to gain good skills and credentials. Yet, if many parents decide to participate in a collective political process, the result may be a reallocation of fiscal resources to improve the local schools. The educational background of the parents of students living in the district is also an important constraint on school outcomes. Inasmuch as better-educated parents create more intellectually stimulating home environments, better monitor the completion of homework, and demonstrate more interest in what goes on in school, the quality of the classroom environment will be improved for all students. So if, in response to inferior public education, better-educated parents move out of the district or enroll their children in private schools, the constraints on all parents who remain in the public school system becomes tighter. For example, housing developers may cater to parents with substantial status by building new, high-quality subdivisions that create exclusive niches in the spatial opportunity structure. After incorporation, these niches may provide a wide range of attractive amenities and public services that encourage the success of the children living there.

Thus, those who are successful in one round of spatial status competition are in a better financial position in the next round in the evolving structure, thereby improving their and their children's odds of perpetuating this success and of generating market forces that alter the structure itself over time. Conversely, those who early in life make little headway in their status are relegated to inferior niches in the spatial opportunity structure, where their subsequent choices tend to perpetuate their inferior status. When society as a whole views some of these decisions as social problems concentrated in low-status niches, the larger opportunity structure can be altered in many ways. Those with financial means move away from neighborhoods and schools of concentrated disadvantage, weakening the local retail sector and the entry-level job opportunities they provide. The same moves may strain the financial capacity of the local political jurisdiction, forcing a retrenchment in public services. Certain locales can thus generate a self-reinforcing spiral of spatial decline and individual impoverishment.

Interim Summary of Heuristic Model

Within the framework summarized in figure 1, it is easy to comprehend how space plays a vital role not only as a foundation for inequality but also for perpetuating intergenerational inequality. Through cumulative causation and path dependency, those with the greatest status achieved early in life can situate themselves in a segment of the opportunity structure that enhances their prospects for continued success and provides their offspring with improved chances for doing the same. Over time, the spatial opportunity structure in turn evolves in ways that further benefit those with the greatest achieved status. By contrast, those who start with little typically are stuck in place, both geographically and socioeconomically, as Sharkey and Elwert (2011) document.[6]

EVIDENCE ON EFFECTS OF SPATIAL CONTEXT ON INDIVIDUAL OUTCOMES

The second claim motivating this paper is that the spatial organization of social and economic inequality maintains or reinforces inequalities across multiple domains of social and economic status. Obtaining unbiased, meaningful estimates of the independent, causal effect of spatial components of an individual's existential context is challenging (for an extensive discussion, see Galster 2008). Per-

6. The normative underpinnings of the geographic opportunity structure are presented by Dawkins (forthcoming).

haps the most contentious aspect, however, is the issue of geographic selection bias (Manski 1995, 2000; Duncan, Connell, and Klebanov 1997; Ginther, Haveman, and Wolfe 2000; Dietz 2002). The central issue is that individuals being studied (or their parents) likely have unmeasured motivations, behaviors, and skills related to their own (or their children's) socioeconomic prospects and move from and to certain types of places as a consequence of these unobserved characteristics. Any observed relationship between geographic conditions and outcomes for adults or their offspring may therefore be biased.[7] Skeptics may rightly argue that what is being measured is simply another impact of (unmeasured) individual attributes, not the impact of the space in which the individual resides.

Estimating Causal Impacts of Spatial Context

Three general empirical approaches have been adopted in response to the challenge of geographic selection bias. The most common approach consists of a variety of econometric techniques applied to observational (nonexperimentally generated) longitudinal datasets involving individuals and their spatial contexts. The two other, less common approaches use natural or experimental designs to generate quasi-random or random assignments of households to neighborhoods.

Econometric Models Based on Observational Data

Most studies of spatial context effects have used observational data collected from surveys of individual households in a variety of places as a result of mundane factors associated with normal market transactions. The subset that has tried to overcome geographic selection bias uses one or more of the following approaches (Galster and Hedman 2013):

- Difference models based on longitudinal data. The biases from unobserved, time-invariant individual characteristics are eliminated by measuring differences between two periods in outcomes and spatial contexts (Bolster et al. 2007; Galster et al. 2008; Musterd et al. 2008; van Ham and Manley 2009; Galster, Andersson, and Musterd 2010).
- Fixed-effect models based on longitudinal data. Unobserved, time-invariant characteristics of individuals that may lead to both geographic selection and outcomes are measured by individual dummy variables (Weinberg, Reagan, and Yankow 2004; Musterd, Galster, and Andersson 2012).
- Instrumental variables for spatial context characteristics. Proxy variables for geographic characteristics are devised that only vary according to attributes exogenous to the individual and thus are uncorrelated with their unobserved characteristics (Duncan, Connell, and Klebanov 1997; Crowder and South 2003; Crowder and Teachman 2004; Galster et al. 2007; Kling, Liebman, and Katz 2007; Ludwig et al. 2008; Cutler, Glaeser, and Vigdor 2008; Sari 2012; Hedman and Galster 2013; Damm 2014).
- Residents of same block. If sorting on individual unobservables at the census block level is minimal, then the impacts of networks among these very localized neighbors should be free of geographic selection bias (Bayer, Ross, and Topa 2008)
- Timing of events. Individuals moving into certain, well-defined types of places (such as public housing developments) after an event being investigated (such as a school achievement test) are likely to share common unobservable characteristics with individuals moving into the same places just before the event, so the short-term effect of the place can be measured by comparing the two groups' outcomes (Weinhardt 2014); analogously, Sharkey (2010) and Sharkey et al. (2012, 2014) address the selection bias

7. The direction of the bias has been the subject of debate, both Christopher Jencks and Susan Mayer (1990) and Marta Tienda (1991) arguing that measured contextual impacts are biased upward, and Jeanne Brooks-Gunn, Greg Duncan, and Lawrence Aber (1997) arguing the opposite. Lisa Gennetian, Lisa Sanbonmatsu, and Jens Ludwig (2011) show that these biases can be substantial enough to seriously distort conclusions about the magnitude and direction of context effects.

problem by exploiting the variation in the timing of local homicides compared with interview assessments for a sample of children in families that have previously selected the same neighborhood.

- Propensity score matching. Individuals who are closely matched on a wide variety of observable characteristics that predict their similar residential mobility behavior are likely to be well matched on their unobservable characteristics as well; comparisons between matches of differences in their spatial contexts and individual outcomes should thus provide unbiased causal evidence (Harding 2003).
- Inverse probability of treatment weighting (IPTW). Like propensity score matching, IPTW uses a model of selection into the treatment status to predict the probability that an individual is in the treatment state in which the individual is observed. A weighted pseudo-sample is then constructed in which the treatment and control groups are balanced on observables. IPTW models selection into treatment status at multiple time points, allowing for unbiased estimates of treatment effects over time in the presence of observed confounders that vary over time and may be endogenous to the treatment. Sharkey and Felix Elwert (2011) use this method in combination with a formal sensitivity analysis to estimate the cumulative effect of multigenerational exposure to neighborhood poverty on cognitive development.
- Nonmovers. Analyzing how exogenous neighborhood changes induce different outcomes for individuals who do not move during the analysis period arguably avoids the mobility selection issue (Sharkey 2012; Galster and Hedman 2013; Gibbons, Silva, and Weinhardt 2013, 2014).

None of these econometric fixes to observational datasets are without challenge. For example, difference models reduce statistical power by shrinking variation in the outcome variable and assume that change relationships are independent of starting conditions. Fixed-effect models assume that the individual dummies adequately capture the bundle of unobservables for all times during the panel and that the effect of this bundle remains constant during the panel. Instrumental variables must be both valid and strong. Micro-scale investigations are limited to neighborhood effect mechanisms than operate only at the small geographic scales and assume no residential sorting on unobservables at that scale. Relying on the timing of moves immediately before and after and event assumes that context effects operate quickly after exposure. Propensity score matching requires assumptions about the strong relationship between unobservable and observable characteristics of individuals. Those who do not move may be exhibiting residential selection based on unobserved characteristics.

Quasi-Random Assignment Natural Experiments

It is sometimes possible to observe nonmarket interventions into households' residential locations that mimic random assignment. In the United States, such experiments typically have been based on court-ordered, public housing racial-ethnic desegregation programs (Rosenbaum 1991; Briggs 1997; Fauth, Leventhal, and Brooks-Gunn 2007), regional fair-share housing requirements (Schwartz 2010; Casciano and Massey 2012) or scattered-site public housing assignments (Santiago et al. 2014). In Canada and Europe, they have involved allocation of tenants to social housing (Oreopoulos 2003; Damm 2009, 2014; Rotger and Galster 2015) or placement of refugees in particular locales (Edin, Fredricksson, and Åslund 2003; Åslund and Fredricksson 2009).

Although these natural experiments may indeed provide some exogenous variation in locations, the geographic selection problem is unlikely to be avoided completely. In most cases, program staff makes assignments and participants have some nontrivial latitude in which locations they choose, both initially and subsequent to original placement. Moreover, programs that involve rental vouchers (Gautreaux, for example) entail selection in who succeeds in locating rental vacancies in qualifying locations and signing leases within the requisite period. These various potential selec-

tion processes raise the possibility that low-income families who succeed in living persistently in low-poverty neighborhoods were especially motivated, resourceful and, perhaps, courageous—traits poorly measured by researchers but likely ones that would help them and their children succeed irrespective of their spatial contexts. Additional empirical problems can arise if sampled subjects move quickly from their quasi-randomly assigned dwellings to another location, thereby minimizing exposure to measured context and potentially confounding consequences because moving itself can be disruptive. As time passes, the randomness of location can erode as selection of who stays in initially assigned places and who moves away comes into play. Finally, limitations are possible in the range of places to which study participants moved or were assigned because of where available private rental or subsidized housing was located, thereby reducing the power of statistical tests to discern context effects.

Random Assignment Experiments

Many researchers advocate a random assignment experimental approach for best avoiding biases from geographic selection. Data on outcomes that can be produced by an experimental design whereby individuals or households are randomly assigned to different geographic contexts is indeed, in theory, the preferred method. In this regard, the U.S. Moving to Opportunity (MTO) demonstration has been touted conventionally as the study from which to draw conclusions about the magnitude of neighborhood effects (Smolensky 2007; Sanbonmatsu et al. 2011; Ludwig 2012). The MTO research design randomly assigned public housing residents who volunteered to participate in one of three groups: controls that got no voucher but stayed in public housing in disadvantaged neighborhoods, recipients of rental vouchers with no restrictions, and recipients of rental vouchers and relocation assistance who had to move to census tracts with less than 10 percent poverty rates and remain for at least a year.

Debate over the power of MTO as an unambiguous test of spatial context effects has been considerable (see Clampet-Lundquist and Massey 2008; Sampson 2008; Burdick-Will et al. 2011; Briggs, Popkin, and Goering 2010; Briggs et al. 2008, 2011; Sanbonmatsu et al. 2011; Ludwig 2012). The debate focuses on five domains. First, although MTO randomly assigned participants to treatment groups, it randomly assigned characteristics neither of neighborhoods initially occupied by voucher holders (except maximum poverty rates for the experimental group) nor of neighborhoods in which participants in all three groups moved subsequently. Thus, a question remains about the degree to which geographic selection on unobservables persists. Second, MTO may not have created adequate duration of exposure to neighborhood conditions by any group at any location to observe much treatment effect. Third, MTO overlooked the potentially indelible developmental effects on adult experimental group participants who spent their childhoods in disadvantaged neighborhoods. Fourth, it appears that even experimental MTO movers rarely moved out of predominantly African American–occupied neighborhoods near those of concentrated disadvantage and achieved only modest changes in school quality and job accessibility. Thus, they may not have experienced sizable enhancements in their geographic opportunity structures. For these reasons, MTO may not have provided definitive evidence about the potential effects on low-income families from prolonged residence in multiply advantaged neighborhoods, despite its theoretical promise and conventional wisdom.

In summary, none of the three approaches to measuring effects of spatial context has proven limitation-free and unambiguously superior. Nevertheless, they as a group offer the strongest, plausibly causal evidence to date on the topic at hand. In our review, therefore, we synthesize findings only from these methodologically rigorous studies that use one or more of the approaches.

An Overview of the Scientific Literature on Spatial Context Effects

We organize our review by six outcome domains that clearly are related to socioeconomic opportunity: cognitive and behavioral development, educational performance and attain-

ment, teen fertility, physical and mental health, labor force participation and earnings, and crime. We emphasize at the outset that the scope, diversity and complexity of the relevant literature is vast in comparison with the length imitations of this paper. Thus, we do not attempt to review findings in any detail, reconcile conflicting results, nor attempt any formal meta-analysis. Instead, our aim is basic: in each outcome domain we tally the number of (methodologically rigorous) studies that find substantial, statistically significant effects of at least some aspect of spatial context (for at least some set of individuals) and those that do not.

Cognitive Skills and Academic Performance

Recent meta-analysis of the international literature (Niewenhuis and Hooimeijer 2014) and a comprehensive review of the U.S. literature (Sharkey and Faber 2014) find nontrivial neighborhood effects on the development of cognitive skills, academic performance, and educational attainment. Our assessment of the methodologically sophisticated literature reaches a similar conclusion, though the magnitude of the neighborhood effect likely varies across individuals and groups.

Measures of cognitive skills have been used to assess evidence for neighborhood effects frequently over the past twenty years (for reviews, see Sastry 2012; Sharkey and Faber 2014), but fewer studies have taken steps to address the problem of selection bias. Two studies have modeled selection into poor neighborhoods and then used inverse probability of treatment weighting to identify the impact of long-term exposure to neighborhood poverty on cognitive skill development. Using data from Chicago, Sampson, Sharkey, and Stephen Raudenbush (2008) find that living in neighborhoods of concentrated disadvantage leads to substantial declines in reading and language skills assessed years later. Sharkey and Elwert (2011) use national data from the Panel Study of Income Dynamics and find that family exposure to neighborhood poverty over consecutive generations reduces children's performance on tests of broad reading skills and applied problems skills by more than half of a standard deviation. A formal sensitivity analysis showed that the effect of multigenerational neighborhood poverty was robust to substantial potential bias arising from unobserved selection processes.

As described, Sharkey and his colleagues exploit the timing of incidents of violence to identify the acute impact of exposure to violence in children's environments on their performance on cognitive skills assessments. Sharkey (2010) finds that exposure to a recent homicide within close proximity to a child's home reduced the performance of African American children on tests of reading, language, and applied problems by more than a third of a standard deviation. In a subsequent study, Sharkey and his colleagues (2012) find similar impacts of recent exposure to nearby homicides on children's performance on vocabulary assessments as well as impacts on assessments of impulse control and attention.

Experimental evidence comes from the Moving to Opportunity program, and shows mixed and complex results. Several years after the experiment began and ten to fifteen years later, no effects of the intervention were found for the full sample on assessments of cognitive skills (Sanbonmatsu et al. 2006, 2011). However, the experiment generated positive effects on the reading assessments of African Americans across all cities four to seven years after implementation (Sanbonmatsu et al. 2006); positive effects on reading and math scores for the full sample of boys and girls among families that remained in low-poverty neighborhoods for longer durations of time (Turner et al. 2012); and strong positive effects for children in the Baltimore and Chicago sites, which persisted over ten to fifteen years only for the Chicago sample (Burdick-Will et al. 2011; Ludwig, Ladd, and Duncan 2001; Sanbonmatsu et al. 2011).

The research literature on academic outcomes and educational attainment is also large. Many studies using one or more of the described econometric techniques to obtain plausibly causal estimates from observational datasets have been conducted. Methods include propensity score matching (Harding 2003), sibling comparisons (Aaronson 1998; Plotnick and Hoffman 1999), fixed-effects (Plotnick and Hoffman 1999; Vartanian and Gleason

1999; Jargowsky and El Komi 2011), instrumental variables (Duncan, Connell, and Klebanov 1997; Crowder and South 2003; Galster et al. 2007), nonmovers (Gibbons, Silva, and Weinhardt 2014), and timing of events (Sharkey et al. 2014; Weinhardt 2014; Carlson and Cowan 2015). All of these find strong residential neighborhood effects on variously measured educational outcomes, with only two exceptions: Plotnick and Hoffman (1999), using U.S. data and Gibbons, Silva, and Weinhardt (2013) and Weinhardt (2014) using U.K. data.

Numerous studies based on natural experiments also are relevant in this outcome domain. These include data based on Gautreaux and Yonkers public housing desegregation programs (Rosenbaum 1995; Fauth, Leventhal, and Brooks-Gunn 2007; DeLuca et al. 2010), public housing revitalization programs (Jacob 2004; Clampet-Lundquist 2007), assignment to public housing waiting lists (Ludwig et al. 2011), inclusionary zoning mandates (Schwartz 2010; Casciano and Massey 2012), combined assisted housing-education programs (Tach et al. 2016) and public housing assignments (Santiago et al. 2014; Galster et al. 2015, 2016; Galster, Santiago, and Stack 2015; Galster and Santiago, forthcoming). These natural quasi-experiments provided only one example of no observed context effects (Jacob 2004),[8] though several of the observed effects in other studies were contingent on gender or ethnicity.

Recent evidence from MTO on college attendance is relevant to the discussion of neighborhood effects on educational attainment. Chetty, Nathaniel Hendren, and Lawrence Katz's (2015) reanalysis of MTO data found that moving to a lower-poverty neighborhood significantly increased college attendance rates for children who were younger than thirteen when their families moved to the neighborhoods, compared with experimental group children who moved when they were older or children in the other study groups.

Risky Behaviors and Violence

We now turn to evidence on developmental disorders and risky behaviors. The Denver public housing natural experiment is exploited by Anna Maria Santiago and her colleagues (2014) to estimate neighborhood effects on the hazard of low-income African American and Latino children being diagnosed with a neurodevelopmental disorder (retardation, learning disabilities, developmental delays, autism, ADD-ADHD). Several aspects of neighborhood context (especially safety, prestige, nativity and ethnic mix, neurotoxin pollution) proved strongly and robustly predictive. Neurocognitive developmental disorders were not investigated directly.

As for risky behaviors, we find only six studies of context effects involving the described econometric approaches to overcoming geographic selection; most identified effects on risky behaviors except smoking. Using propensity score matching, Jennifer Ahern and her colleagues (2008) find that an individual's propensity to drink was related to the neighborhood's culture of alcohol use; Scott Novak and his colleagues (2006), however, find only a small, barely discernable effect of retail tobacco outlet density on youth cigarette smoking. Markus Jokela (2014) uses the fixed-effect modeling approach and finds no impact of neighborhood disadvantage on the probability of smoking. Stephen Gibbons, Olmo Silva, and Felix Weinhardt (2013) also used fixed effects but find that the share of neighbors from lower-status backgrounds increases the chances of teen boys engaging in anti-social behaviors like graffiti, vandalism, shoplifting, fighting, or public disturbance. Two approaches using inverse probability weighting (marginal structural model) methods find that neighborhood poverty is strongly related to the odds of binge drinking (Cerdá et al. 2010) and drug injecting (Nandi et al. 2010).

Only three examples of either the random or quasi-random neighborhood assignment approaches are relevant to risky behaviors. Strong context effects on risky behaviors appear in both studies but are contingent on gender, ethnicity, and timing. Early MTO findings suggest that substantial reductions on girls' rates of risky behaviors and boys' drug use can

8. Little context effect was observed here because the experimental households did not use their housing vouchers to change their neighborhood characteristics significantly.

be attributed to residence in lower-poverty neighborhoods. However, after initial declines in risky behavior, boys living in lower-poverty neighborhoods four to seven years after their first move were more likely to reengage in risky behaviors (Sanbonmatsu et al. 2011). By the end of the demonstration project, girls assigned to low-poverty neighborhoods were less likely to have serious behavioral problems. No group differences in more serious antisocial behaviors were significant, however (Sanbonmatsu et al. 2011). Santiago and her colleagues' analysis of data from a Denver natural experiment reveals that cumulative exposure to multiple dimensions of neighborhood context (especially safety, social status, and ethnic and nativity composition) affected the hazard of adolescents running away from home, using aggressive or violent behavior, or initiating marijuana use, though with substantial ethnic heterogeneity of relationships. Finally, Magdalena Cerdá and her colleagues (2012) examine the impact of a new transportation infrastructure intervention in Medellin, Colombia, on violent behavior. and find that investment decreased violence significantly.

Teen Fertility

Very few studies have used any of the described statistical techniques to account for potential geographic selection bias confounding observational data on the fertility patterns of youth and their neighborhood contexts. The two exceptions are Robert Plotnick and Saul Hoffman (1999) and David Harding (2003). Plotnick and Hoffman find that neighborhood effects on teen childbearing disappeared when using a model of fixed effects with only observations of sisters, whereas Harding finds that neighborhood effects remained significant despite propensity score matching and argues that selection bias would need to be unreasonably large to rule out causal effects of neighborhood socioeconomic conditions on teen childbearing.

The evidence from natural and random assignment experiments is more consistent. Santiago and her colleagues (2014) find that hazards of teenage childbearing and fathering were greater in neighborhoods with higher property crime rates, lower occupational prestige and higher percentages of Latinos, though strength of effect depended on gender and ethnicity. Results from the MTO demonstration show that girls in the experimental group whose parent or parents moved to low-poverty neighborhoods felt safer and less pressured to engage in early sexual activity (and thus, by implication, early pregnancy and childbearing) in their new neighborhoods (Popkin, Leventhal, and Weismann 2010; Sanbonmatsu et al. 2011). Chetty, Hendren, and Katz (2015) analyze the subset of MTO experimental children who moved to low-poverty neighborhoods before they were thirteen and observe that they, indeed, were less likely to become single parents.

Physical and Mental Health

Michael Oakes and his colleagues (2015) recently completed a comprehensive review of the empirical literature related to neighborhood effects on health. After reviewing 1,369 articles, using criteria similar criteria to ours, they conclude that only about 1 percent produced plausibly causal estimates. A handful use the described statistical techniques applied to observational data and find that the results, though somewhat inconsistent, do not point to strong context effects on health. Three studies based on propensity score methods demonstrated no or barely discernable effects on minority infant mortality using different measures of neighborhood (Schootman et al. 2007; Johnson, Oakes, and Anderton 2008; Hearst, Oakes, and Johnson 2008). Based on inverse probability weighting (marginal structural model) methods, researchers have determined that neighborhood poverty was related to mortality in a strong but nonlinear way (Do, Wang, and Elliott 2013) but had mixed effects on self-assessed health and disability (Glymour et al. 2010). Finally, Jokela (2014) uses the fixed-effect modeling approach and finds no impact of neighborhood disadvantage on self-rated health, mental health and physical functioning, and amount of physical activity, instead finding evidence of selection of those with poorer health into more disadvantaged neighborhoods.

The random assignment experimental evidence here is also mixed but shows impacts on some health outcomes. MTO results show no

significant differences in child asthma rates among groups assigned to neighborhoods with differing poverty rates, but does show effects on adult obesity and diabetes rates (Ludwig et al. 2011) and much lower stress levels among adults and children among those assigned initially to low-poverty neighborhoods (Sanbonmatsu et al. 2011). Findings for mental health suggested neighborhood effects but their size and direction were extremely varied, depending on lag of measurement after assignment, gender, and age (see Leventhal and Brooks-Gunn 2003; Kessler et al. 2014). Stephanie Moulton, Laura Peck, and Keri-Nicole Dillman (2014) analyze the subset of MTO experimental households who lived for substantial periods in low-poverty neighborhoods and conclude that health benefits may be much larger for that group.

The few natural experiments involving health outcomes consistently find neighborhood effects, at least on selected health indicators. Debra Cohen and her colleagues (2006) use exogenous shocks in neighborhood alcohol outlet density associated with the 1992 Los Angeles riots as a causal identification strategy and find strong impacts on neighborhood gonorrhea rates. Mark Votruba and Jeffrey Kling (2009) analyze data from the Gautreaux public housing relocation program. They find that when young, low-income African American men relocated to higher-education neighborhoods their all-cause and homicide mortality rates dropped relative to those moving to more disadvantaged areas. Finally, Santiago and her colleagues (2014) find strong neighborhood effects on the diagnoses of several child and adolescent health problems (asthma, obesity) using data from the Denver public housing natural experiment, although the relationships often depended on gender and ethnicity and in some cases manifested nonlinear thresholds. Asthma problems, for example, arose sooner for low-income, minority children residing in neighborhoods that had more property crime, lower occupational prestige, and higher concentrations of air pollution.

Labor Force Participation and Earnings

Most investigators find neighborhood effects on labor market outcomes when using one of the discussed econometric techniques on nonexperimental, observational datasets. Several studies using U.S. data (Weinberg, Reagan, and Yankow 2004; Dawkins, Shen, and Sanchez 2005; Cutler, Glaeser, and Vigdor 2008; Bayer, Ross, and Topa 2008; Sharkey 2012), several using Swedish data (Galster et al. 2008; Galster, Andersson, and Musterd 2010, 2015, 2016; Musterd, Galster, and Andersson 2012; Hedman and Galster 2013), one Danish study (Damm 2014) and one French study (Sari 2012) find nontrivial neighborhood effects on various adult labor market outcomes such as income and employment rates. One U.S.-based study (Plotnick and Hoffman 1999) and three U.K.-based analyses (Bolster et al. 2007; Propper et al. 2007; van Ham and Manley 2010) find minor, if any, neighborhood effects, and instead suggest geographic selection dominates.

Several researchers have probed the effect of spatial context on labor market outcomes exploiting the quasi-random assignment occurring in natural experiments. Studies in the United States (Rosenbaum 1991, 1995; Rubinowitz and Rosenbaum 2000; DeLuca et al. 2010; Galster, Santiago, and Lucero 2015a, 2015b; Galster et al. 2015; Chyn 2016), in Sweden (Edin, Fredricksson, and Åslund 2003; Åslund and Fredricksson 2009), and in Denmark (Damm 2009, 2014) all find evidence of strong neighborhood effects on several measures of adult and teen labor market outcomes in their analyses. The only finding of a trivial neighborhood effect using this approach came from a Canadian natural experiment study (Oreopoulos 2003).

Virtually no investigations using MTO data uncovered any substantial short- or long-term context effects on teen or adult labor market outcomes (for example, Ludwig, Duncan, and Pinkston 2005; Katz, Kling, and Liebman 2001; Ludwig, Ladd, and Duncan 2001; Ludwig, Duncan, and Hirschfield 2001; Orr et al. 2003; Kling, Leibman, and Katz 2007; Ludwig et al. 2008; Sanbonmatsu et al. 2011; Ludwig 2012). Three exceptions are notable. Susan Clampet-Lundquist and Douglas Massey (2008) and Margery Turner and her colleagues (2012) analyze the subset of MTO experimental households who lived for extended periods in low-poverty neighborhoods and find that their

adult employment and earnings outcomes are substantially better than those of the control group. Chetty, Hendren, and Katz (2015) analyze the subset of MTO experimental children who moved to low-poverty neighborhoods before they were thirteen and observed that they had significantly higher earnings as young adults than either experimental group children who moved after age thirteen or children from the other study groups.

Crime

Six recent studies provide consistent evidence concerning the strong (if heterogeneous by gender) causal impact of geographic context on criminality. Mark Livingston and his colleagues (2014) use temporal lags and neighborhood fixed effects identify the effect of the share of criminal offenders resident in Glasgow postal code areas. They find that higher neighborhood shares of residents committing offenses during a quarter strongly predicted the probability of first-time violent and property offenses among residents in the subsequent quarter.

Four natural experiments are relevant here. Exploiting the quasi-randomness of assignment to public housing in Denver, Santiago and her colleagues (2014) find that low-income Latino and African American youth had greater hazards of engaging in violent behaviors in neighborhoods with lower occupational prestige and higher property crime rates, though with gendered impacts. Anna Damm and Christian Dustmann (2014) use the Danish dispersed settlement policy for refugees to identify causal impacts of municipal characteristics on youth criminality. They find that the share in a municipality of those age fifteen to twenty-five who were convicted of a crime during the year the family was assigned there strongly raised the probability of young male (but not female) refugees being convicted of a crime (especially for violent crimes and younger teens) during subsequent years. Gabriel Rotger and Galster (2015) use exogenous assignment to social housing in Copenhagen to identify strong causal effects of the prior drug offending characteristics of the housing development's residents at time of assignment on the odds of individuals ages fifteen through twenty-five who had just moved in committing property and drug crimes over the next two years. Stephen Billings, David Deming, and Stephen Ross (2016) study with natural experimental data the determinants of youth crime of fourteen-year-old students in Mecklenburg County, North Carolina. They demonstrate that peer effects on criminal behavior only arise when school peers (of the same race and gender) live less than a half-mile from each other and that the effects are stronger when neighbors are assigned to the same grade.

Finally, modest evidence indicates context effects on male criminality from MTO. Early impact evaluations indicate fewer arrests among males from families randomly assigned to low-poverty neighborhoods (Katz, Kling, and Liebman 2001; Ludwig, Duncan, and Hirshfeld 2001). These effects appeared to diminish and even reverse over time, however (Kling, Ludwig, and Katz 2005; Sanbonmatsu et al. 2011).

Findings

Table 1 summarizes the findings on the number of (methodologically rigorous) studies that have found substantial, statistically significant effects of spatial context (for at least some set of individuals) and those that have not, by outcome domain. The tally makes it clear that the preponderance of evidence in every outcome domain is that multiple aspects of spatial context exert important causal influences over a wide range of outcomes related to socioeconomic opportunity, though which aspects are most powerful depends on the outcome and the gender and ethnicity of the individuals in question.

EMPIRICAL GAPS IN THE STUDY OF SPATIAL INEQUALITY

Trends showing the rise of inequality in income and wealth have reached the mainstream as national and world leaders, policymakers, and the public have become increasingly focused on inequality in economic status as a defining issue of our time. Our goal in this introduction, and in the issue as a whole, is to shed light on the spatial dimensions of inequality. We argue that space is a particularly severe, and underappreciated, dimension of

Table 1. Conclusions from Causal Analyses of Neighborhood Effects

Significant Effects	No Effects
Cognitive and behavioral development	
Ahern et al. 2008; Cerda et al. 2010; Nandi et al. 2010; Sanbonmatsu et al. 2011; Cerda et al. 2012; Gibbons, Silva, and Weinhardt 2013; Santiago et al. 2014, this volume	Novak et al. 2006; Jokela 2014
Educational performance and attainment	
Rosenbaum 1995; Duncan, Connell, and Klebanov 1997; Vartanian and Gleason 1999; Crowder and South 2003; Clampet-Lundquist 2007; Fauth, Leventhal, and Brooks-Gunn 2007; Galster et al. 2007; DeLuca et al. 2010; Schwartz 2010; Sharkey and Sampson 2010; Jargowsky and El Komi 2011; Sharkey et al. 2012, 2014; Casciano and Massey 2012; Gibbons, Silva, and Weinhardt 2014; Santiago et al. 2014; Carlson and Cowan 2015; Chetty, Hendren, and Katz 2015; Galster et al. 2015, 2016; Galster, Santiago, and Stack 2015; Tach et al. 2016; Galster and Santiago, forthcoming	Plotnick and Hoffman 1999; Ludwig, Ladd, and Duncan 2001; Jacob 2004; Sanbonmatsu et al. 2006, 2011; Kling, Liebman, and Katz, 2007; Gibbons, Silva, and Weinhardt 2013; Weinhardt 2014
Teen fertility	
Harding 2003; Popkin, Leventhal and Weismann 2010; Sanbonmatsu et al. 2011; Santiago et al. 2014; Chetty, Hendren and Katz 2015; Galster and Santiago, forthcoming	Plotnick and Hoffman 1999
Physical and mental health	
Leventhal and Brooks-Gunn 2003; Cohen et al. 2006; Votruba and Kling 2009; Glymour et al. 2010; Ludwig et al. 2011; Sanbonmatsu et al. 2011; Do et al. 2013; Kessler et al. 2014; Moulton, Peck, and Dillman 2014; Santiago et al. 2014	Schootman et al. 2007; Hearst et al. 2008; Johnson et al. 2008; Jokela 2014
Labor force participation and earnings	
Rosenbaum 1991,1995; Rubinowitz and Rosenbaum 2000; Edin, Fredricksson, and Åslund 2003; Weinberg, Reagan, and Yankow 2004; Dawkins, Shen, and Sanchez 2005; Cutler, Glaeser, and Vigdor 2008; Bayer, Ross, and Topa 2008, Clampet-Lundquist and Massey 2008; Galster et al. 2008; Åslund and Fredricksson 2009; Damm 2009, 2014; DeLuca et al. 2010; Galster, Andersson, and Musterd 2010, 2015, 2016; Musterd, Galster, and Andersson 2012; Sari 2012; Sharkey 2012; Turner et al. 2012; Hedman and Galster 2013; Damm 2014; Galster, Santiago, and Lucero 2015a, 2015b; Chetty, Hendren, and Katz 2015; Galster et al. 2015; Chyn 2016; Galster and Santiago, forthcoming	Plotnick and Hoffman 1999; Ludwig, Duncan, and Pinkston 2005; Katz, Kling, and Liebman 2001; Ludwig, Ladd, and Duncan 2001; Ludwig, Duncan, and Hirschfield 2001; Orr et al. 2003; Oreopoulos 2003; Bolster et al. 2007; Kling, Leibman, and Katz 2007; Propper et al. 2007; Ludwig et al. 2008; van Ham and Manley 2010; Sanbonmatsu et al. 2011; Ludwig 2012
Crime	
Katz, Kling, and Liebman 2001; Ludwig, Duncan, and Hirshfeld 2001; Livingston et al. 2014; Santiago et al. 2014; Damm and Dustmann 2014; Rotger and Galster 2015; Billings, Deming, and Ross 2016	Kling, Ludwig, and Katz, 2005; Sanbonmatsu et al. 2011

Source: Authors' compilation.
Note: Only techniques yielding plausibly causal estimates are summarized.

inequality in the United States. We argue, further, that a focus on space is crucial to understanding inequality in social and economic status because, as summarized in figure 1, space plays both mediating and modifying roles in the relationship between individual attributes and achieved status.

The articles in this issue fill in important gaps in what we know about spatial inequality and its relationship to other dimensions of the U.S. stratification system. Specifically, the contributions provide theory and evidence on three questions.

First, what are the scale and dimensions of spatial inequality in the United States, and how does the stratification of space emerge and change? The first article in this issue, from Sean Reardon, Joseph Townsend, and Lindsay Fox, may well become a seminal contribution to this question by developing what the authors refer to as "a general approach to describing the joint distribution of race and income among neighborhoods." Over time, researchers have published research that describes the average neighborhood characteristics of different racial and ethnic groups at different levels of income, but these studies have offered piecemeal evidence on the way that race and ethnicity and economic status overlap across the nation's neighborhoods. This article develops a systematic approach to characterizing the joint distribution of race and income in American communities, and opens the way for a wide range of different analyses that can offer more refined insights into the nature of spatial inequality.

The approach Reardon, Townsend, and Fox develop can be used as a flexible tool to analyze how, for instance, the average racial composition of neighborhoods changes for white, black, Hispanic, or Asian families at the bottom and the top of the income distribution. The authors suggest that the results presented in the article could be used to characterize the way that neighborhood income changes as household income rises, and how this varies across racial and ethnic groups. Applying this set of methods to counties, metropolitan areas, or commuting zones across the United States, the results presented in this article can become an extremely valuable resource for understanding geographic variation in the joint distribution of neighborhood race-ethnic composition and economic status. But the article also contains substantive conclusions that stand on their own as meaningful contributions to our understanding of the way that race and income interact in neighborhoods across America. It reinforces findings from other research showing that black and Hispanic households live in lower-income communities after considering their own household income, and it reveals that black and Hispanic neighbors tend to have lower incomes than white or Asian neighbors for all racial groups, regardless of income. The authors note how this simple finding may shed light on the way that within-neighborhood racial gaps in income could "play a role in shaping racial stereotypes."

The article from Ann Owens moves beyond much of the existing literature on residential segregation by pointing to the unique segregation of households with children and to the role of schools in contributing to the uneven distribution of racial and ethnic groups. Owens links the literature on neighborhood and school segregation by analyzing segregation within and between school districts, providing "evidence on the degree to which school options, operationalized here as residence in a particular school district boundary, contributes to racial residential segregation." She demonstrates that children live in more unequal residential environments than adults, meaning any consequences of racial segregation will be more pronounced among young people. At the same time, the growing diversity of the United States population is most pronounced among young people, which means all children will continue to be exposed to a rising share of neighbors from different racial and ethnic backgrounds, particularly Hispanics.

In a particularly novel contribution to the literature, Owens provides evidence suggesting that school boundaries play an important role in explaining why households with children are more segregated than those without. Segregation between school districts is higher among children than among adults, indicating that the school boundary takes on added importance for families with children. To under-

stand neighborhood segregation, Owens argues, it is crucial to consider the way that parents use the boundaries of school districts when they make decisions about where to live.

Rory Kramer's article shifts from the nation as a whole to a single city, Philadelphia. He focuses on the way that physical attributes of geographic spaces can be used to form clear boundaries in order to maintain racial segregation in this highly stratified city that has experienced substantial demographic change, arguing for a theoretical focus on boundaries as a natural means to measure and understand the spatial scale of neighborhoods. Kramer puts forth an innovative method to define and measure spatial boundaries, using spatial analytic tools to observe salient geographic boundaries in Philadelphia that serve as markers separating communities from each other.

Although this method is effective in identifying the boundaries that maintain racial segregation, it is less effective in assessing why and how those boundaries change (or do not change) over time. For this task, local history is crucial. Kramer goes on to present a historical analysis outlining the factors that shape the rigidity and salience of geographic boundaries in specific neighborhoods in Philadelphia. He argues that the collective response of whites to the potential for neighborhood racial and ethnic change helps explain why some boundaries persist but others fade away. The conclusion to the article provides a powerful theory linking the features of physical space, demographic change, local history, and collective action in an attempt to understand how the stratification of a city's neighborhoods emerges and changes over time.

Like most of the papers in this volume, both the Kramer and the Owens articles move from descriptive science toward explanation; they thus make a contribution not only to questions of scale and dimensions of spatial inequality but also to *our second major question addressed in this issue: what are the processes that generate and reproduce spatial inequality?* Robert Sampson, Jared Schachner, and Robert Mare address this question with an analysis of the mechanisms linking individual residential trajectories with aggregate patterns of neighborhood inequality. Although much of the literature on neighborhood poverty is based on the image of poor, crime-ridden neighborhoods of the deindustrialized cities of the Northeast and Midwest, Sampson, Schachner, and Mare draw on a unique dataset that has followed families and neighborhoods in Los Angeles from 2000 to 2013, and focus their attention on processes of change in a city that looks nothing like the places that are the settings for most of the literature on urban inequality. By following families over the course of a severe economic downturn, they shed light on how change arises, both through residential mobility and as an external shock to stationary families across neighborhoods.

Although the stability of neighborhood inequality in Los Angeles is similar to that in Chicago, the traditional laboratory for the study of urban poverty, the dynamics leading to urban inequality are very different in Los Angeles. The most disadvantaged neighborhoods are occupied by both black and Latino families, and the rigid boundaries between central city and suburbs that characterize cities like Chicago are much less salient in Los Angeles. Residential mobility does not disrupt the rigid racial and ethnic hierarchy of neighborhoods in this city, nor does the shock of the Great Recession. Despite differences in the positioning of groups within this hierarchy, the persistence of urban inequality in Los Angeles bears striking resemblance to that in older industrial cities like Chicago.

Continuing the California-based studies, John Hipp and Charis Kubrin ask how levels and changes in the racial, ethnic, and economic composition of the area that surrounds a neighborhood—what they call an *egohood*—is associated with levels and changes in crime within the focal community. The idea and operationalization of egohoods is itself an important contribution, an improvement on the default conception of neighborhoods as distinct areas separated by an administrative boundary. Hipp and Kubrin consider the unique area surrounding every block within the city of Los Angeles. It is not just the level of disadvantage that influences criminal activity, the authors argue, but also the mix of people within the surrounding area, the potential for interactions between low-income and high-income

Angelenos, that predicts the probability of a crime. And it is not simply the mix of people at a given time but also the changes that are unfolding within and around a community that matter when considering the likelihood that crime will begin to rise or fall in a particular area. Hipp and Kubrin make several methodological advancements in the study of urban dynamics and crime, and in doing so generate new substantive insights into the social processes that make criminal activity more or less likely. Their article is likely to become a major contribution to the study of spatial inequality and crime.

A third question addressed in this issue is how space can serve as a mechanism to maintain, reinforce, or reproduce inequality. Again, it is a question addressed, in many ways, by the articles already described, but three additional studies address it directly. Lincoln Quillian develops a formal model that allows for a more refined understanding of the conditions under which the separation of different segments of any two groups, classified by any dimension of status or advantage, is likely to result in an amplification or reduction of inequality. One natural application is to understand how changes in the joint distribution of race and income in the United States has influenced overall racial inequality in terms of spatial exposure to disadvantaged neighbors. Quillian's contribution thus provides a clear theoretical model of how racial segregation is related to racial inequality, and his application to urban areas in the United States is an excellent complement to the contribution from Reardon, Townsend, and Fox.

Anna Maria Santiago, Eun Lye Lee, Jessica Lucero, and Rebecca Wiersma exploit a natural experiment whereby families receiving housing assistance in Denver were assigned to apartment units through a system that appears to be close to random. The authors document patterns of movement for families in the program, and show persuasively that assignment to apartments in different neighborhoods can be considered exogenous if it is analyzed within racial and ethnic groups. They examine how various dimensions of the neighborhood environment are linked with three risky behaviors during adolescence, including running away from home, engaging in violent or aggressive behavior, and using marijuana. They find that neighborhood racial and ethnic composition, social and economic composition, and safety are strongly connected with elevated levels of these risk behaviors, all of which have the potential to generate long-term and to have severe impacts on young people's developmental trajectories.

The study takes seriously the idea that processes of sorting into neighborhoods across Denver work differently for black and Latino families, even if they are all receiving housing assistance from the city. By estimating the impact of neighborhood conditions separately for black and Latino adolescents, the research not only allows for stronger causal inferences but also provides unique insight into the impact of neighborhoods for Latino youths, a group not well represented in the literature. The study allows for a more refined look at the specific aspects of neighborhoods that are most salient for adolescent risky behaviors, and does so in a way that generates important insights that can be used to guide housing policy.

In the final article, Christopher Browning, Catherine Calder, Lauren Krivo, Anna Smith, and Bethany Boettner take a novel approach to analyzing neighborhood effect mechanisms by examining the extent to which individuals from different social and economic backgrounds share space when they carry out routine activities such as going shopping or going to work. Using data from Los Angeles, the authors find that families with higher social and economic status are less likely to share common spaces with a diverse set of neighbors, and particularly in highly unequal neighborhoods. The analysis allows one to see beyond the socioeconomic composition of neighborhoods to the set of interactions that residents have with each other. In this way, this article presents evidence on interaction-based mechanisms of neighborhood effects that have been posited for several decades, yet rarely tested empirically.

Our hope is that this collection of articles advances the literature on the spatial foundations of inequality and generates additional research taking seriously the idea of space as

a core dimension of stratification in the United States and beyond. We are grateful for the chance to edit such high-quality articles and to be able to work with this group of impressive scholars.

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