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Neighborhood Effects on Children's Development in Experimental and Nonexperimental Research

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Abstract

Children's neighborhood contexts are defined by rising socioeconomic inequality and segregation. This article reviews several decades of research on how neighborhood socioeconomic conditions are associated with children's development. The nonexperimental literature suggests that the most salient neighborhood socioeconomic condition depends on the outcome—disadvantage for social, emotional, and behavioral outcomes and advantage for achievement-related outcomes. Moreover, children's cumulative exposure to neighborhood socioeconomic conditions over the first two decades of life, and possibly especially in childhood, may matter most for later development. These findings are partially supported by the few experimental studies available, and across study designs, neighborhood effects are typically modest. In order to improve our understanding of this topic, we recommend methodologically rigorous designs—experimental and nonexperimental—and comparative approaches, particularly ones addressing the complexities of development in neighborhood contexts. To guide this research, we provide an integrated framework that captures a broad and dynamic perspective including macro forces, neighborhood social processes and resources, physical features, spatial dynamics, and individual differences.

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INTRODUCTION

Rising social inequality is a defining feature of the world children grow up in today (Currie 2012). The neighborhoods they live in are a primary developmental context where this feature of contemporary life plays out acutely. For example, between 2012 and 2016, 13% of US children lived in high-poverty neighborhoods, defined as neighborhoods where 30% or more of the residents were poor, compared with 9% of children in 2000 (AECF 2018). At the same time that children in poor families became more isolated in pockets of disadvantage, children from more affluent families were concentrated in their own communities of advantage, exacerbating inequality across neighborhood contexts (Reardon & Bischoff 2016). This trend of persistent income segregation, dating back to the 1970s (Reardon & Bischoff 2016), also occurred in Europe and Canada, but was less extreme (Andersson & Musterd 2005, Galster 2012, Wacquant 2008).

The marked coincidence of concentrated disadvantage with racial segregation sets the United States apart from its contemporaries as well. More than 30 years of research has documented the overrepresentation and increased concentration of minorities in high-poverty neighborhoods in America (e.g., Jargowsky 1997, 2015; Massey & Denton 1993; Reardon et al. 2015). Although African American segregation is on the decline, segregation of Latinos and Asians has been relatively stable over this period (Bischoff & Reardon 2014). Yet, African Americans continue to be the most residentially segregated group in the United States regardless of income.

These changing spatial dynamics have had profound implications for children's lives because neighborhoods typically circumscribe children's daily activities and interactions with individuals and with institutions that control access to opportunities and resources (Leventhal et al. 2015). Thus, it is not surprising that over the past several decades researchers and policy makers have turned their attention to the potential consequences of neighborhood socioeconomic conditions for children's development. On the research front, myriad studies document links between neighborhood residence and human development across the life course, from birth to death and in each developmental period in between (notwithstanding concerns about the causal nature of these links). For instance, after individual and family background factors are accounted for,

neighborhood socioeconomic status (SES) is associated with infants' health (e.g., Buka et al. 2003), young children's school readiness (e.g., Leventhal & Brooks-Gunn 2001), adolescents' delinquent behavior (e.g., Sampson et al. 2002), young adults' economic attainment (e.g., Chetty & Hendren 2018a), and older adults' mortality (e.g., Diez-Roux & Mair 2010).

On the policy and programmatic front, neighborhoods became a target of intervention for improving the lives of disadvantaged children and families. The most telling example is the Promise Neighborhoods Initiative, launched by President Barack Obama through the US Department of Education, to fund place-based change for children and families in poor communities (Komro et al. 2011). These two fronts did not operate in isolation; rather, one informed the other, and vice versa. The body of research that emanated from this mutually influential relationship provides the foundation of our current understanding of children's development in neighborhood contexts, particularly as related to socioeconomic conditions.

Since its inception, the contemporary field of neighborhood research has been an interdisciplinary endeavor. Its deepest roots are in urban sociology, but anthropology, demography, economics, epidemiology/public health, developmental psychology, geography, and public policy, among other disciplines, have all played a significant role in shaping the field (e.g., Entwisle 2007, Jencks & Mayer 1990, Leventhal et al. 2015, Sampson & Morenoff 1997). Each discipline has contributed to the conceptual, methodological, and empirical directions of the field in various ways. Because we are developmental scientists, and this journal is devoted to developmental psychology, we use a developmental lens to review the state of neighborhood research. In so doing, we focus on outcomes of primary interest to developmentalists, notably children's achievement and socioemotional and behavioral functioning, across the first two decades of life.

Accordingly, the goal of this review is to provide a road map of the research on neighborhood contexts and children's development conducted over the past several decades, highlighting issues pertinent to developmental psychology. The next section provides theoretical frameworks for understanding neighborhood influences on children's development, followed by a discussion of methodological challenges encountered when addressing this topic. The third section reviews empirical evidence linking neighborhood socioeconomic conditions to children's development, taking into consideration the methodological issues outlined. The fourth section sets an agenda for research in the coming decades and discusses policy and practice implications that can be drawn at this time. The final section presents our conclusions.

THEORETICAL FRAMEWORKS FOR UNDERSTANDING CHILDREN'S DEVELOPMENT IN NEIGHBORHOOD CONTEXTS

Research linking neighborhood contexts and children's development is informed by two types of theoretical frameworks: (*a*) broad theories conceptualizing human development as the product of cumulative interactions between individual children and the multiple contexts in which they interact and (*b*) models focusing more narrowly on the role of the neighborhood context specifically. We review these two types of frameworks in sequence, then introduce an integrative model.

Broad Theoretical Frameworks

Ecological models that emphasize the importance of placing children's development in context are relevant to neighborhood research. Bronfenbrenner (1979) contributed greatly to the introduction of such models in developmental psychology in the 1970s (Ceci 2006). He urged the field to move away from studying children in laboratories unconnected to daily life, and toward more naturalistic research approaches observing children as they develop in real-world settings. To guide

and promote research along these lines, Bronfenbrenner & Morris (2006) put forward an ecological model of development in which the developing child is situated at the center of a series of embedded and interrelated contexts. Some of these contexts refer to settings in which children directly and regularly interact with persons or objects, including not only the local neighborhood but also the family, school, and peer group. These proximal settings, in turn, are thought to be shaped by, and to channel the influence of, a series of larger, more distal contexts defined by economic, legal, policy, cultural, or historical trends. Importantly, these contexts, proximal and distal, micro and macro, are viewed as interacting with one another and with the child's own individual characteristics, biological and psychological. Building on these foundations, among others (Lerner et al. 2015), more recent relational–developmental systems (RDS) metatheories further elucidate how growth jointly involves individuals and contexts in complex, integrated, nonlinear webs of enmeshed multidirectional relationships (Overton 2015).

Neighborhood-Specific Models

When applied to specific research questions, general metatheories such as the RDS approach need to be combined with more specific, complementary conceptual models current in the particular field of inquiry (Lerner & Overton 2008). Several such models linking neighborhood contexts and individual outcomes exist in the literature. Expanding on initial propositions put forward in the 1940s (Shaw & McKay 1942), they focus on neighborhood structure, processes, and spatial dynamics.

Neighborhood structure. Neighborhood structure refers to population distributions across neighborhoods and the ensuing place-based social hierarchies (Blau 1977). In practical terms, it is usually operationalized by aggregated socioeconomic or demographic characteristics of local residents, typically measured by a government census (Sampson et al. 2002). In US-based research, the most common census-derived geographical units used to define the neighborhood context are tracts (approximately 3,000 to 8,000 people) or block groups (approximately 600 to 3,000 people).

Neighborhood poverty and related concepts such as neighborhood low SES and neighborhood-concentrated disadvantage are structural characteristics that have received substantial research attention in the literature focusing on children's development (Leventhal et al. 2015, Sampson 2019). Generally, neighborhood poverty refers to the proportion of households with incomes below the poverty threshold, with high poverty marked by percentages higher than 20% to 40% (e.g., Wilson 1987). By contrast, neighborhood low SES or concentrated disadvantage typically encompasses a broader constellation of adversities not limited to poverty, such as rates of reception of public assistance, unemployment, or single-parent families. Racial composition or segregation is another important social factor defining neighborhood structure. It is often very closely associated with neighborhood poverty and disadvantage, so much so that these aspects cannot always be empirically distinguished from one another (e.g., Sampson 2019). Nevertheless, racial composition is preferably treated separately given its particular historical and social relevance, especially in certain national contexts like the United States (Charles 2003, Massey & Tannen 2018). In general, concentrated disadvantage, as indexed by neighborhood poverty, low SES, and segregation, is considered a potential impediment to healthy child development.

Neighborhood poverty and related constructs occupy a prominent place in the literature, but they are not the only neighborhood structural characteristics thought to affect children's development. At the other end of the spectrum, neighborhood affluence, typically captured by the presence of high-income, highly educated residents occupying professional or managerial jobs, is considered an attribute that in most cases can bestow developmental advantages on children's well-being

(Dupéré et al. 2010, Jencks & Mayer 1990; cf. Luthar & Barkin 2012). Residential stability, often operationalized by levels of homeownership and population turnover, is also regarded as a potential advantage (Sampson 2019). Another aspect, ethnic heterogeneity or diversity, usually referring to the proportion of immigrant residents and/or the presence of a variety of ethnic groups in a given neighborhood, may confer both advantages and disadvantages on children's development (Jackson et al. 2016, van der Meer & Tolsma 2014). In fact, neighborhood structure as a whole is best construed in terms of the configuration of risks and benefits because neighborhoods are highly heterogeneous (Jackson et al. 2016, Odgers 2015, Sharkey & Faber 2014).

Neighborhood structure is typically defined with respect to social composition, but the physical aspects of neighborhoods are closely related. Physical aspects that are potentially relevant to children's development include building characteristics and upkeep, traffic conditions, walkability, green spaces, water sources, aesthetics, and population density (e.g., Ross & Mirowsky 1999, Sampson 2017, Sirgy & Cornwell 2002). The case of lead exposure is a vivid example of how physical features such as subpar water sources and aging plumbing systems can pose very significant risks to children's health and well-being (Muller et al. 2018). Yet, compared with the social structure of neighborhoods, physical attributes have received less research attention from developmentally oriented researchers, notwithstanding those aspects related to neighborhood processes, such as physical disorder (e.g., presence of litter, graffiti, abandoned housing) and access to green spaces (Chawla 2015, Franzini et al. 2009, Kohen et al. 2002). Interrelations among neighborhood structure, physical attributes, and neighborhood processes and their links to children's development represent an area ripe for research.

Neighborhood processes. Neighborhood structure forms a backdrop that frames and shapes more proximal processes in and with which residents directly engage in their daily lives (Leventhal et al. 2009, 2015, 2018, 2019). Such neighborhood processes typically refer either to informal interactions between residents or to more formal links between residents and their local institutions such as schools, recreational centers, health clinics, or police stations (Sampson & Morenoff 1997, Weisburd et al. 2014). Individuals' experiences with these informal and formal processes unfolding in neighborhoods are usually measured by surveys (of residents or of key local informants such as community leaders, preferably with multiple individuals interviewed per neighborhood), direct observations, or administrative records and public data sources (from, e.g., hospitals, schools, law enforcement agencies, or commercial sources; Raudenbush & Sampson 1999). In addition to these established approaches, innovative measurement strategies have emerged in recent years, relying on the use of field experiment techniques and taking advantage of digital data from mobile devices and new technologies such as geographic information systems (Keizer et al. 2008, Odgers et al. 2012, Sampson 2017). In the remainder of this section, we describe key informal and formal neighborhood processes that can be captured by these various measurement approaches.

Among informal processes thought to have repercussions for children's development, collective efficacy figures prominently. Collective efficacy refers to residents' perceived capacity to act cooperatively to achieve shared goals, such as living in a safe, clean, and generally agreeable environment (Bandura 2000, Sampson 2012, Sampson et al. 1997). According to social disorganization theories (e.g., Kubrin & Weitzer 2003), neighborhood structural characteristics can either strengthen or erode collective efficacy. For instance, in communities characterized by high levels of concentrated disadvantage, population turnover, and ethnic heterogeneity, trust and social connections between residents may be insufficient to support the development of strong feelings of collective efficacy (Sampson 2019, Sampson et al. 1997). In turn, when collective efficacy is low, communities struggle to contain problematic behaviors like crime and violence, which can cause serious disruptions in children's lives because they may either engage in these behaviors

themselves or be exposed as victims and witnesses (e.g., Sharkey 2010, Sharkey et al. 2012). By increasing violence and disorder, low collective efficacy can affect the reputation of a neighborhood and its retention and attraction of more formal supports (e.g., businesses, high-quality schools), creating feedback loops of multidirectional, dynamic influences between neighborhood structure and processes (Sampson 2019).

In addition to shared concerns and social connections among relatively loose networks of residents (e.g., collective efficacy), close personal relationships are thought to be shaped by, and to transmit the effects of, broader neighborhood structural characteristics. Neighborhoods matter to children because they matter to parents. Specifically, neighborhood-level concentrated disadvantage is independently associated with parenting outcomes such as abuse and neglect, as well as with less extreme but still compromised parenting characterized by low warmth, gaps in monitoring, harsh discipline, and limited provision of learning opportunities (for a review, see Shuey & Leventhal 2019). Parenting quality may be undermined in disadvantaged neighborhoods, at least in part because parents in such contexts are exposed to pronounced stress in the form of social and physical disorder and violence, while having diminished support networks and health capital (e.g., Blair et al. 2014, Ludwig et al. 2012, Molnar et al. 2016).

Beyond family relationships, social contagion and cultural theories suggest that neighborhood-based peer relationships are especially relevant in adolescence (Christakis & Fowler 2013, Crane 1991, Dishion & Tipsord 2011, Harding 2011). In contrast to earlier childhood, during this period peers play an increasingly important role, as the fulfillment of key developmental tasks requires the establishment of positive and meaningful relationships, including romantic relationships, with similar-aged peers outside the family (Kerr et al. 2003, Rubin et al. 2015). These peers come predominantly from the adolescents' own neighborhood (Dolcini et al. 2005). In other words, the neighborhood provides a set of peers available for chance encounters toward whom adolescents can then gravitate according to their affinities and preferences (Brechwald & Prinstein 2011, Currarini et al. 2010). Given the higher prevalence of juvenile delinquency and problem behaviors in more disadvantaged neighborhoods (e.g., Braga & Clarke 2014), it is not entirely surprising that adolescents who reside in such communities are more likely than their counterparts in less disadvantaged neighborhoods to affiliate with deviant peers, regardless of their own initial individual profile (Haynie et al. 2006, Ingoldsby et al. 2006). In turn, contact with deviant peers can alter adolescents' behavior through multiple processes, including deviancy training, norms, and role modeling (Harding 2011, Snyder et al. 2008). Disadvantaged youth, however, do not necessarily fare better when they are surrounded by predominantly advantaged peers. Rather, the relative deprivation perspective posits that gaps between one's own situation and that of other comparatively advantaged peers in the immediate vicinity might generate distress, negative self-perceptions, and delinquent behaviors (Odgers 2015).

In addition to these more informal channels, neighborhood structural characteristics can operate through more formal ones related to local institutions. Many such institutions play a central role in children's daily lives and in their physical, educational, socioemotional, and spiritual development, including child care facilities, schools, places of worship, recreational centers, libraries, health and social services, and local businesses providing goods (e.g., grocery stores) and employment opportunities (Leventhal & Brooks-Gunn 2000). These institutions' revenue, and thus their ability to support high-quality services and to hire and retain qualified staff, often depends in large part on local residents' collective capacity to pay directly as patrons or indirectly via taxes. With the rise of income inequality and of the spatial concentration of poverty and wealth, this collective capacity varies widely across neighborhoods (Reardon & Bischoff 2011, Sampson 2019). Concretely, it means that children are increasingly likely to attend preschools and schools with socioeconomic compositions that mirror those of their neighborhoods, compounding inequalities for children

and families. The availability, quantity, and quality of these institutional resources likely directly affect children's development, but also may indirectly transmit neighborhood structural effects to children to the extent that these resources support or hinder parents in their child-rearing endeavors (Shuey & Leventhal 2019).

Similar processes are likely to apply to social capital as well. Parents with more economic means tend to invest not only more money but also more nonmonetary resources, such as time, in local institutions by participating in parent–teacher associations, advocacy groups, and the like (Lee & Bowen 2006, Park & Holloway 2013). Parental involvement, in turn, generates social capital and service improvements to the benefit of all children attending local institutions, regardless of their own parents' degree of engagement (Small 2006).

Spatial dynamics. The developmental impact of an individual neighborhood's structural characteristics and related social and institutional processes can be attenuated or compounded by higher-order spatial dynamics operating within and between bordering neighborhoods (Chamberlain & Hipp 2015, Krivo et al. 2013). Higher-order dynamics can reinforce social isolation and inequality via processes characterized as double disadvantage or even triple disadvantage (Sampson 2019). Children in disadvantaged neighborhoods are considered to be doubly disadvantaged if nonresidents visiting their neighborhoods also tend to be disadvantaged, and triply disadvantaged if they themselves regularly spend time in other disadvantaged neighborhoods. It is very likely that similar higher-order processes operate for neighborhood advantage. To date, the consequences for children of such higher-order patterns, often referred to or closely aligned with notions of activity spaces, have received scant research attention (Browning & Soller 2014). This gap should be addressed in light of emerging findings linking such patterns with children's outcomes (i.e., exposure to violence; Graif & Matthews 2017).

Integrative Framework

The conceptual models reviewed in the preceding subsection specifically focusing on neighborhood structure, processes, physical attributes, and spatial dynamics should be embedded within broader theories of human development, such as RDS metatheories, as noted above. To facilitate this process, we propose an integrative framework, highlighting the multidirectional influences among macro structure, neighborhood characteristics, and individual children and their families (**Figure 1**) (see also Sampson 2019, White et al. 2018).

The dynamic flow within and across systems proposed in the integrative framework can be illustrated from the parents' perspective (**Figure 1**, *right*): Parents' characteristics influence children, and vice versa, in transactional processes unfolding over time (Sameroff 2009). Parents anchor these processes in the larger neighborhood context, notably through their active selection of residential neighborhoods for their family. This selection reflects, among other things, parental income and preferences, which themselves depend to some degree on macroeconomic trends, taxation and redistribution laws, and norms and practices regarding ethnic/racial blending or segregation (Anderson et al. 2014b, Arcaya et al. 2015, Bischoff & Reardon 2014). Parents' decisions regarding where to live and whether to move or stay in particular neighborhoods can shape not only their children's short- and long-term developmental outcomes (Chetty et al. 2014, 2016; Leventhal et al. 2015) but also their neighborhoods' structure and internal processes (Sharkey & Faber 2014, Sharkey & Sampson 2010, Wickes & Hipp 2018). In turn, within-neighborhood processes can spill over into neighboring communities and influence citywide sorting and segregation—trends that can feed back into individual neighborhoods and influence the evolution of their structure and processes and, ultimately, children's development.

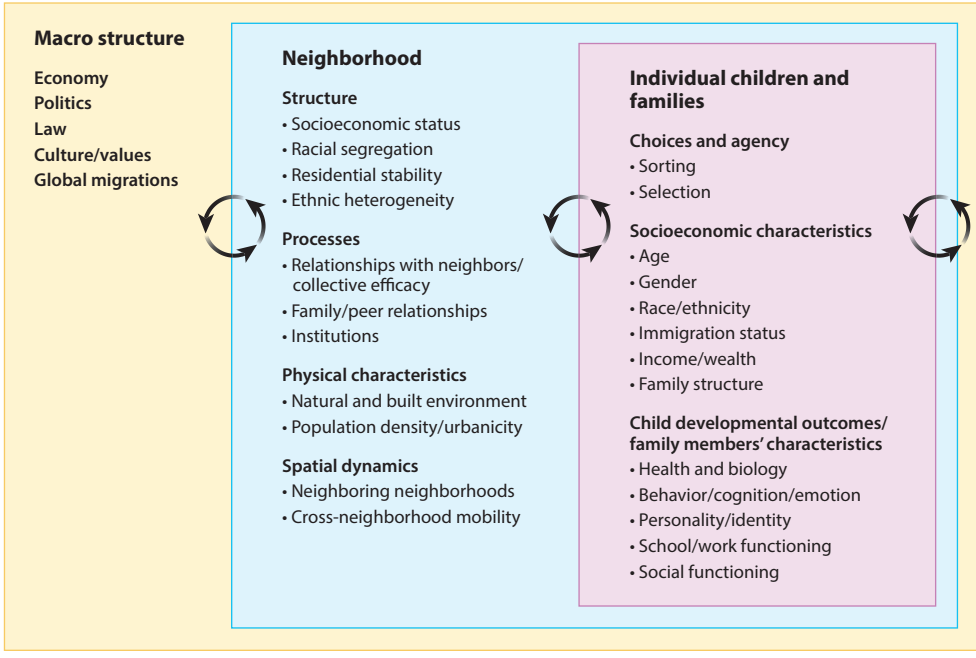

Figure 1

Integrated model of children's development in neighborhood contexts. The three levels are interconnected with looping arrows to further underscore the vision of development as the product of interrelated, dynamic influences between multiple levels operating as integrated systems.

METHODOLOGICAL CHALLENGES

The proposed integrative framework describes how children and neighborhoods are part of complex systems. As a result, isolating potential neighborhood influences on children's development is fraught methodologically. Among the multiple methodological challenges facing researchers in the field, selection or omitted-variable bias is considered the most fundamental (Duncan et al. 1997, Hedman & van Ham 2012). Selection bias occurs, for instance, when children's exposure to a particular type of neighborhood is a consequence of their parents' financial, personal (e.g., physical or mental health), or social resources to move out of or stay in that neighborhood (e.g., Arcaya et al. 2015). In this context, any association between, for example, neighborhood poverty and children's development may be due to or capturing family disadvantage and related challenges. Selection can also be driven by children's own characteristics and choices, such as when children create their own social environment by converging toward, and engaging in, friendships with peers who tend to be similar to them (Brechwald & Prinstein 2011). In an effort to address this fundamental problem, researchers have relied on various research designs, both experimental and nonexperimental (i.e., correlational).

Experimental, Quasi-Experimental, and Natural Experimental Designs

Experimental designs in which participants are randomly allocated to a treatment or control condition are generally considered the gold standard for tackling selection bias and isolating causal effects (Cook et al. 2002). In principle, random assignment creates balanced groups that are similar, prior to any treatment or intervention, across factors such as income or health that

are both measured and unmeasured. Thus, any differences between the treatment and control groups emerging from differential exposure to an intervention can theoretically be attributed to the intervention rather than to preexisting differences across groups.

In the neighborhood literature, such designs are rare; the Moving to Opportunity (MTO) for Fair Housing Demonstration is a notable exception (Goering & Feins 2003). MTO was a housing mobility program that offered families living in highly disadvantaged neighborhoods an opportunity to move to more advantaged ones. At the time of enrollment in the 1990s, the ~4,600 participating families were living in public housing projects in high-poverty neighborhoods (i.e., poverty rates ≥40%) in five US cities. These families were randomly assigned to one of three groups: (*a*) an experimental group, who received housing vouchers and special assistance to relocate to private housing in low-poverty neighborhoods (i.e., poverty rates ≤10%); (*b*) a comparison group, who received traditional vouchers to relocate to neighborhoods of their choice; and (*c*) an in-place control group, who did not receive vouchers but continued to receive project-based assistance. As discussed in the next section, evaluations and follow-up studies of MTO provide mixed evidence about the effects of neighborhood poverty on children's development.

A handful of housing mobility programs resemble MTO but are based on quasi-experimental designs lacking formal random assignment of families to neighborhoods. Three of these studies, the Gautreaux Program, Mount Laurel, and the Yonkers Project, were initiated following court battles over public or affordable housing (Casciano & Massey 2012, Fauth et al. 2007, Rubinowitz & Rosenbaum 2000). In two cases (Mount Laurel and Yonkers), new public or affordable housing units were built in middle-class neighborhoods, whereas in the third (Gautreaux), relocation to less poor and more racially integrated neighborhoods was achieved through housing vouchers. All three studies are considered quasi-experimental because families who relocated from poor to less poor neighborhoods, or who formed the comparison group, were not selected randomly from the pool of interested families. Yet, the relocation process is described as approximating randomization, because the main factors underlying neighborhood placement, such as housing availability, are presumably unrelated to family preferences and characteristics.

Other studies rely on natural experiments in an attempt to estimate potential neighborhood effects in an unbiased manner. In such cases, researchers take advantage of exogenous shocks differentially affecting neighborhoods or individuals' residential decisions. These shocks include policy changes improving neighborhood conditions, as well as political crises, natural disasters, or plant closures forcing relocation (e.g., Cerdá et al. 2012, Gould et al. 2004). For example, Kirk (2009) examined the impact of residential relocations following Hurricane Katrina on inmates' recidivism during probation. Because these shocks induce change in neighborhood conditions that do not depend on individual choices, differences observed between affected and unaffected individuals are theoretically unlikely to reflect self-selection into particular neighborhoods.

Experiments and their variants are useful for estimating neighborhood effects in a relatively unbiased manner, but they are limited in several ways. First, true experiments with random assignment are extremely costly and demanding and thus very rare, as the singularity of MTO underscores. Quasi-experiments and natural experiments are also quite rare, which is unsurprising given the exceptional conditions necessary for such studies (e.g., desegregation court orders or natural disasters). Second, most studies employing experimental designs tend to focus on very specific segments of the population, such as inmates or very poor, predominantly minority families living in highly disadvantaged neighborhoods, raising potential generalizability problems. Third, and relatedly, the very limited conditions under which these experiments occur mean that some theoretically relevant neighborhood attributes likely to influence children's development (e.g., affluence, collective efficacy) have not been examined with these designs. As a result, alternative nonexperimental designs are needed to complement such experiments.

Nonexperimental Designs

The lion's share of studies linking neighborhood characteristics and children's development are correlational. Early examples of such studies appended neighborhood information from the US Census to existing large, nationally representative data sets containing information about children and their families, such as the Panel Study of Income Dynamics (PSID) (Duncan 1994) or the National Longitudinal Survey of Youth (Chase-Lansdale et al. 1991). Because these studies are national in scope and sampled participants across the United States, estimations were based on a small number of children within each neighborhood. Thus, they did not permit multilevel modeling of children's outcomes or the aggregation of individual reports to create neighborhood-level process measures (e.g., collective efficacy). Both strategies provide more-unbiased estimates of neighborhood effects than designs modeled solely at the individual level (Raudenbush & Sampson 1999). In other words, although these early studies allowed researchers to examine potential links between neighborhood structure and children's development, they were ill-suited for the exploration of social processes and resources that might underlie such associations. In addition, because census characteristics were often linked with survey data at a specific or single time point, researchers could not investigate dynamic, bidirectional links between children's development and neighborhood context, for example, by considering developmental sensitivities or neighborhood change brought about through internal (e.g., gentrification) or external (e.g., mobility) processes. Later studies using national data have begun to address this shortcoming (e.g., Sharkey 2012, Wheaton & Clarke 2003).

The next wave of neighborhood research employed new designs in which the neighborhood context was an integral part of the sampling strategy. These studies were typically city based and used two-stage stratified sampling. First, neighborhoods were sampled to represent the full range of structural characteristics of interest. Second, within each sampled neighborhood, a minimum number of households with children, typically at least 15 to 30, were surveyed to allow for the use of analytical strategies tailored for nested data (Raudenbush & Sampson 1999).

A well-known example of this type of design is the Project on Human Development in Chicago Neighborhoods (PHDCN), launched in the mid-1990s (Sampson 2012). In PHDCN, 80 Chicago neighborhoods varying in socioeconomic and racial/ethnic composition were sampled, and approximately 75 children were recruited within each neighborhood and then followed in three waves of data collection over six years. The information provided by families over time was augmented by other modes of data collection focusing on neighborhoods, including an independent community surveys of residents, systematic social observations, and expert surveys. Unlike the earlier nonexperimental studies, these various design components allowed researchers to examine neighborhood social processes and resources potentially underlying associations between neighborhood structure and children's development, often in a dynamic manner (Leventhal et al. 2015). This research has been critical in helping to build better theoretical frameworks about neighborhood influences on children's development, as explicated in the previous section. Studies modeled after PHDCN have been conducted in other cities in the United States and beyond, including Los Angeles and Stockholm, Sweden (Sampson & Wikström 2008, Sastry et al. 2006).

Neighborhood-based designs present many advantages, including a rich and dynamic understanding of children's neighborhood context through multiple lenses (e.g., census and other administrative sources, parents, local residents, independent observers, community leaders); however, because of their observational nature, these studies remain subject to potential selection or omitted-variable bias. In nonexperimental neighborhood studies, neighborhood-based or otherwise, this problem is often addressed by statistically controlling for basic potential confounders including child (e.g., gender, age) and family (e.g., income, structure) sociodemographic

characteristics. Such statistical controls may be insufficient, because processes beyond these characteristics can influence neighborhood selection and children's development, such as maternal depression or family values (e.g., Duncan et al. 1997). Efforts to incorporate these other processes by adding a multitude of control variables may present their own problems. Some research indicates that process variables may not add much to neighborhood selection beyond basic sociodemographic characteristics, but rather may capture potential pathways of neighborhood influences, which would occur, for instance, if maternal depression was treated as a control variable in a situation where neighborhood conditions contributed to the emergence of mothers' depression (Sampson & Sharkey 2008).

In an effort to address the challenges associated with trying to statistically control away potential selection bias in nonexperimental neighborhood research, alternative methodological approaches have been proposed, allowing more rigorous analysis of correlational data. Some of these approaches try to hold family characteristics constant by comparing close relatives like siblings or first cousins differentially exposed to particular neighborhood conditions, or by comparing, through fixed-effects models, an individual to himself or herself at times when exposed or not exposed to certain types of neighborhood contexts (Aaronson 1998; Chetty & Hendren 2018a,b; Larsen & Merlo 2005; Timberlake 2007). Within this type of approach, Chetty & Hendren's (2018a,b) recent research stands out as an exemplar. Using data from federal income tax records for millions of families, these researchers examined how variation in neighborhood exposures brought about by residential mobility occurring at different ages for different children, including differential exposures between siblings experiencing a family move while younger or older, was associated with adult outcomes (e.g., earnings, educational attainment). In addition to this fixed-effects strategy, they implemented other approaches to manage selection bias and identify causal effects, including natural experiment techniques. Thus, this research is a model not only because of the scope of the data but also because of the multiplicity of approaches implemented to estimate causal effects and to identify mechanisms of influence.

In addition to these fixed-effects strategies, approaches based on instrumental variables and two-stage regression models have been used to minimize unmeasured correlations between neighborhood characteristics and children's outcomes (Foster & McLanahan 1996, Galster et al. 2007). Other researchers have relied on propensity score and counterfactual approaches to compare children exposed to certain neighborhood conditions with unexposed but otherwise similar peers with closely matched propensities for exposure (Sampson et al. 2008, Wodtke et al. 2011). With this backdrop, we now turn to a review of what research using these various designs tells us about neighborhood socioeconomic conditions and children's development, in light of the challenges outlined here.

WHAT WE KNOW: NEIGHBORHOOD SOCIOECONOMIC STATUS AND CHILDREN'S DEVELOPMENT

This section provides a comprehensive, but not exhaustive, review of research on neighborhood socioeconomic conditions—concentrated poverty or disadvantage and concentrated affluence or advantage—and children's development. We focus on this aspect of neighborhood structure because of its salience in the literature and relevance to contemporary child development as highlighted thus far. The research, extending over several decades, is quite voluminous and has been reviewed by us as well as others in greater detail elsewhere (e.g., Burton & Jarrett 2000, Diez-Roux & Mair 2010, Leventhal & Brooks-Gunn 2000, Leventhal et al. 2015, McBride Murry et al. 2011, Nettles et al. 2008, Sampson et al. 2002, Sharkey & Faber 2014, Shaw & Shelleby 2014).

As such, our approach here is to draw attention to general patterns based on studies that meet certain standards of quality and rigor. Our goal in doing so is to rely on the best evidence available for formulating some overall conclusions regarding what is currently known about neighborhood socioeconomic conditions and children's development. Specifically, given the serious problem of selection or omitted-variable bias outlined in the preceding section, we review only studies that address this problem at least by accounting for individual and family background characteristics in their analyses, such as children's gender, age, race/ethnicity, family structure, and SES (e.g., income, parents' level of education). Furthermore, we start by briefly reviewing results based on less stringent designs, and present results in more detail as we progress toward studies with more robust research designs. With these parameters in mind, we summarize findings first from various nonexperimental strategies, starting with what we refer to as snapshot approaches and then moving on to longitudinal studies and ending with experimental research. In general, because results regarding differences in important individual characteristics such as children's age or developmental status (children versus adolescents), gender, and race/ethnicity are rather mixed, we highlight broad patterns, while noting such differences when consistent patterns exist.

Snapshot Approaches

The vast majority of nonexperimental studies, although based on longitudinal surveys, assess neighborhood socioeconomic conditions at only a single point in time. In other words, in these studies, neighborhoods and, to a lesser extent, children's development are viewed as relatively static and capture only a snapshot of children's neighborhood experiences (for similar arguments, see Jackson & Mare 2007, Sampson 2008). Perhaps the most compelling evidence from this body of research comes from meta-analyses synthesizing results from studies that meet certain criteria (Chang et al. 2016, Johnson 2013). For instance, Chang et al. (2016) analyzed 43 studies on physical aggression and neighborhood disadvantage; all of the studies met clearly specified quality standards (e.g., multilevel, controlled for individual covariates and neighborhood clustering). Across such meta-analytic studies, results confirm general patterns documented in numerous individual studies and gleaned from prior reviews (e.g., Leventhal et al. 2015). Specifically, greater neighborhood advantage or affluence is favorably associated with children's achievement-related outcomes, such as school readiness, test scores, and educational attainment (for potential risks of neighborhood advantage, see Luthar 2003). By contrast, living in a neighborhood marked by greater socioeconomic disadvantage is associated with children's worse emotional, social, and behavioral functioning as captured by outcomes such as behavioral problems, delinquency, and depressive symptoms. Greater neighborhood disadvantage is also associated with adolescents' risky sexual behavior and fertility outcomes.

Across this body of research, the size of neighborhood SES effects is small to moderate. Neighborhood socioeconomic conditions typically account for approximately 5% to 10% of the variance in children's developmental outcomes after accounting for child and family background characteristics (Leventhal & Brooks-Gunn 2000). Such effect sizes are often comparable to those from similar research on other key contexts in children's lives, including families and schools (e.g., Dupéré et al. 2010). To this end, studies drawing on national samples and estimating correlations among neighbors on point-in-time outcomes, such as adolescents' achievement test scores and delinquency and young adults' educational attainment and earnings, find very small correlations, ranging from 0.01 to 0.07 after adjusting for family demographic background (Duncan et al. 2001, Page & Solon 2003, Solon et al. 2000). The authors of these studies argue that such correlations represent upper-bound estimates of neighborhood effects and are quite modest, especially when compared with correlations among siblings and, to a lesser extent, peers.

Together, these early neighborhood studies played a seminal role in drawing developmental psychologists' attention to this topic by highlighting the potential importance of neighborhood contexts for children's development. These studies, however, left many unanswered questions about the nature of these associations, including their dynamic relations over time, as noted above. For instance, might neighborhood effect be larger when considering developmental trajectories as compared with point-in-time estimates?

Longitudinal and Dynamic Approaches

Accordingly, the next line of nonexperimental research, using longitudinal data on neighborhood residence, children's development, or both, took a more dynamic and developmental approach than earlier studies by investigating how the timing and duration of children's exposure to neighborhood socioeconomic conditions are linked to their development. Three general hypotheses emerge from this work, even if they are not always explicitly stated. First, the early childhood hypothesis stemming from research on family income and poverty suggests that the impact on later functioning of family economic resources is more pronounced during early childhood, as opposed to other developmental periods (Duncan et al. 2010). The underlying premise is that this period is marked by rapid developmental changes, and economic deprivation may compromise young children's functioning in ways that have trajectory-setting effects into adolescence and beyond (Shonkoff et al. 2012). Thus, like family income and poverty, neighborhood socioeconomic conditions may be most important during early childhood (Sampson et al. 2008).

Second, the adolescence hypothesis argues that this period is a time of unique vulnerability to neighborhood conditions. Because adolescence is characterized by increasing autonomy and exploration and identity formation, the salience of extrafamilial contexts such as neighborhoods may be greater than in earlier childhood (Leventhal et al. 2009; see also Steinberg & Morris 2001). Third, the cumulative experience hypothesis, which may be the least developmental in nature, stipulates that children's cumulative experiences over the first two decades of life may be more important than exposure during any particular developmental period.

Although the research base is modest, the results are mixed, and most studies do not systematically test each hypothesis, there is some support for the early childhood and cumulative exposure hypotheses. Starting with the early childhood hypothesis, one of the first studies to address this topic used nationally representative data to explore the link between neighborhood disadvantage and young adults' mental health problems (Wheaton & Clarke 2003). Results suggested that exposure to neighborhood disadvantage in childhood (ages 6–11), compared with exposure in adolescence (ages 12–16) or early adulthood (ages 17–23), had the largest association with young adults' mental health problems.

Subsequent studies have incorporated longitudinal measures of children's outcomes in addition to neighborhood socioeconomic conditions. For example, a study based on a diverse US sample found that greater neighborhood advantage in early childhood (1–54 months) was associated with children's superior reading achievement in first grade, but not with subsequent learning rates into adolescence (Dupéré et al. 2010). Another study using the same sample took a more comprehensive approach to investigate associations between exposure to neighborhood poverty and affluence in three developmental periods [early childhood (birth–54 months), middle childhood (kindergarten–grade 5), and adolescence (grades 6–9)], and children's achievement and behavior problems during those same periods (Anderson et al. 2014a). The findings provided some support for the early childhood and cumulative exposure hypotheses, but not the adolescence hypothesis. Specifically, greater neighborhood affluence in early childhood was associated with children's higher achievement scores at that time, and this association endured through age 15 years by

working indirectly via middle childhood achievement. Additional analyses examining how different histories of neighborhood exposure were associated with children's outcomes revealed that prolonged exposure to affluent neighborhoods was beneficial for children's achievement in adolescence.

Similar to this last study, several others using national data provide evidence for the cumulative exposure hypothesis. For instance, in the PSID, cumulative exposure to neighborhood poverty since birth was more strongly associated with adolescents' odds of high school dropout and early childbearing than a single point-in-time estimate at 14 years of age (Crowder & South 2011, South & Crowder 2010); effect sizes for cumulative measures were on the order of 25% larger than point-in-time estimates. Other studies with this sample suggest, on the one hand, that growing up in the most disadvantaged neighborhoods poses the greatest risk to African American adolescents' educational attainment (Wodtke et al. 2011) and, on the other hand, that growing up in the most advantaged neighborhoods has the greatest benefit to European American adolescents' educational attainment (Howell 2019). Finally, a recent economic analysis of administrative data from federal tax records indicates that cumulative exposure to "better" neighborhoods across late childhood and adolescence (ages 9–23) is associated with greater young adult earnings (Chetty & Hendren 2018a).

Despite the emergence of consistent patterns across the nonexperimental research more generally, its validity has been questioned on the grounds of selection or omitted-variable bias (e.g., Duncan et al. 1997, Manski 2000). Responding to this critique, researchers employed more-robust analytic techniques, as described in the previous section, than standard regression with covariates used in most of the nonexperimental studies discussed thus far (e.g., Harding 2003). Taken together, the overall conclusions derived from earlier research are not appreciably different, but effect sizes are often smaller, and some studies fail to report any associations.

One example of consistent findings across methods comes from a study employing propensity score methods. Drawing on data from PHDCN, the longitudinal, neighborhood-based study described above, this study included three cohorts of children 6, 9, and 12 years of age (Sampson et al. 2008). After using propensity score weighting for the likelihood of living in a severely disadvantaged neighborhood at earlier waves of data collection, the researchers found that among African American children, living in a severely disadvantaged neighborhood was associated with later deficits in verbal ability (Sampson et al. 2008). Another study, also based on PHDCN and using propensity score methods, in this case to account for mobility across different types of neighborhoods, found that only boys' trajectories of violent behavior were worse if they lived in neighborhoods that either decreased or increased in poverty compared with their peers in stable neighborhoods (Leventhal & Brooks-Gunn 2011). Youth in high- and moderate-poverty neighborhoods were more susceptible to these neighborhood poverty dynamics than were youth in low-poverty neighborhoods. In summary, these efforts by researchers to use more robust analytic methods than prior research are a step forward for the field, although concerns about selection bias still remain.

Experimental Approaches

Given this persistent challenge of selection bias in the field of neighborhood research, perhaps the strongest evidence to date for the connection between neighborhood socioeconomic conditions and children's development comes from a handful of experimental and quasi-experimental studies because of their ability to minimize this problem (see **Table 1** for a summary of findings). As noted above, most of this research arose from housing programs for low-income, often minority, families receiving housing assistance or who volunteered to participate in these programs, and thus is restricted to this population.

The Gautreaux Program, mentioned above, is the oldest among the experimental studies. A 10-year follow-up of approximately 100 youth who participated in this program showed that poor youth who moved to private housing in affluent suburban neighborhoods were less likely to drop out of high school and more likely to enroll in college preparatory classes and attend college than youth who moved to private housing in poor urban neighborhoods (Kaufman & Rosenbaum

Table 1 Summary of results from published studies using experimental designs

Study	Type of design	Basic design features	Sample	Outcomes examined	Findings
Denver Child Study	Natural experiment in Denver, CO	Housing assignment based on availability of public housing units across economically diverse neighborhoods	425 youth age 18–35 who resided in public housing before or during measurement of outcome	Grades, high school dropout, witnessed violence in adolescence School attendance, employment, out-of-wedlock births in young adulthood	Galster & Santiago (2017): Children younger (birth–12 years) when moved to neighborhoods with higher occupational prestige more likely to attend school and be employed and less likely to have children out of wedlock
Gautreaux Program	Quasi-experiment in Chicago, IL	Housing assignment based on availability of private units in either poor neighborhoods within city limits or more affluent suburbs	107 African American and Latino youth whose families entered program between 1976 and 1981	High school retention, grades, track placement, college attendance, employment, wages, job prestige and benefits	Kaufman & Rosenbaum (1992): Youth who moved to more affluent suburbs more likely to graduate high school, take college prep classes, attend college, be employed, and have higher-paying jobs than youth who remained in city
			2,850 African American male youth relocated before 1995, ≥5 years old at placement and ≤13 years old by December 31, 1999	Mortality—all causes, suicide and homicide, homicide only from administrative data	Votruba & Kling (2009): Male youth who moved to tracts with more college-educated residents had lower rates of mortality (especially for placements during ages 13–19 years)
			1,085 youth relocated between 1977 and 1989 and aged 17 or older between 1990 and 2001	Arrests and convictions for drug, theft, and violent offenses from administrative data	Keels (2008): Male youth who relocated to middle-class suburban neighborhoods had fewer arrests and convictions for drug offenses than counterparts who relocated within Chicago Female youth who relocated to middle-class suburban neighborhoods had more arrests and convictions for drug, theft, or violent offenses than counterparts who relocated within Chicago
Mount Laurel	Quasi-experiment in Mount Laurel, NJ	Housing assignment to new, affordable housing project in middle-class suburb and comparison group of families on waiting list for housing	61 youth ages 12–18	Grades, hours reading per week, exposure to disorder and violence in school, parent involvement in schooling	Casciano & Massey (2012): Youth who moved to subsidized housing in an affluent suburb had higher grade point average and spent more time reading per week than youth who remained in high-poverty neighborhoods

(*Continued*)

Table 1 (*Continued*)

Study	Type of design	Basic design features	Sample	Outcomes examined	Findings
Moving to Opportunity	Randomized experiment in 5 US cities with 5–8-year follow-up	Housing assignment to three groups: (*a*) experimental group received vouchers and assistance to move to low-poverty neighborhoods; (*b*) comparison group received traditional vouchers to relocate to neighborhoods of choice; and (*c*) in-place control group did not receive vouchers but continued receiving project-based assistance	1,807 youth ages 15–20 on December 31, 2001	Physical health problems (self-reported fair/poor health, asthma, obesity, injury), mental health problems (distress, depression symptoms, anxiety symptoms), risky behaviors (marijuana use, smoking, alcohol use, pregnancy), education (graduated high school/still in school, in school or working, math scores, reading scores)	Kling et al. (2007): Youth who moved with low-poverty or traditional vouchers had less generalized anxiety than youth who remained in public housing in high-poverty neighborhoods Youth who moved with traditional vouchers had fewer depressive symptoms than youth who remained in public housing in high-poverty neighborhoods Female youth who moved with low-poverty or traditional vouchers had less marijuana use than counterparts who remained in public housing in high-poverty neighborhoods Female youth who moved with low-poverty vouchers had less psychological distress than counterparts who remained in public housing in high-poverty neighborhoods Female youth who moved with traditional vouchers had less alcohol use than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with low-poverty or traditional vouchers had more injuries/accidents and were more likely to smoke than counterparts who remained in public housing in high-poverty neighborhoods
			4,473 youth aged 15–25 by December 2001 (varies by outcome)	Lifetime arrests for violent, property, drug, or "other" crimes from administrative data; self-reported arrest, delinquency, behavioral problems	Kling et al. (2005): Female youth who moved with low-poverty or traditional vouchers had fewer lifetime arrests for property and violent (low-poverty only) crimes than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with low-poverty vouchers had fewer lifetime arrests for property crimes and behavioral problems than counterparts who remained in public housing in high-poverty neighborhoods
	Randomized experiment in five US cities with 10–15-year follow-up		2,872 youth aged 13–19 at time of follow-up	Presence of mental disorders in the past 12 months (major depressive disorder, panic disorder, posttraumatic stress disorder, oppositional-defiant disorder, intermittent explosive disorder, and conduct disorder)	Kessler et al. (2014): Youth who moved with low-poverty vouchers had more posttraumatic stress disorder than youth who remained in public housing in high-poverty neighborhoods Female youth who moved with traditional vouchers had less depression and conduct disorders than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with low-poverty vouchers had more depression and conduct disorders than counterparts who remained in public housing in high-poverty neighborhoods

(*Continued*)

Table 1 (*Continued*)

Study	Type of design	Basic design features	Sample	Outcomes examined	Findings
			5,101 youth aged 10–20 (varies across outcomes)	Education (reading scores, math scores, school enrollment, college attendance, educationally on-track, employment), physical health (self-reported health, asthma, injuries, obesity), mental health (distress, emotional or behavioral problems), risky and delinquent behaviors (risky behaviors, behavioral problems, delinquency, smoking, alcohol use, arrests for violent crimes and property crimes)	Gennetian et al. (2012): Youth who moved with low-poverty vouchers had more arrests for property crimes than youth who remained in public housing in high-poverty neighborhoods Female youth who moved with low-poverty vouchers had less psychological distress, serious behavioral or emotional problems, and alcohol use than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with low-poverty vouchers were less likely to be employed than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with traditional vouchers were less likely to attend college than counterparts who remained in public housing in high-poverty neighborhoods Male youth who moved with low-poverty or traditional vouchers smoked more than counterparts who remained in public housing in high-poverty neighborhoods
	Randomized experiment in five US cities with long-term follow-up		8,603 ≤21 years old in 2012 and ≥18 years old at randomization	Individual earnings, household income, employment, college attendance rates, college quality, neighborhood characteristics, marital status and fertility, tax filing and tax payments from administrative data	Chetty et al. (2016): Children younger (birth–12 years) when moved with low-poverty or traditional vouchers lived in neighborhoods with less poverty, higher income, less segregation, and fewer single mothers than counterparts who remained in public housing in high-poverty neighborhoods Children younger when moved with low-poverty vouchers had greater earnings than counterparts who remained in public housing in high-poverty neighborhoods Children younger when moved with low-poverty or traditional vouchers had higher college quality and college attendance (low-poverty only) than counterparts who remained in public housing in high-poverty neighborhoods Children older (13–18 years) who moved with low-poverty or traditional vouchers had lower college attendance and college quality (low-poverty only) than counterparts who remained in public housing in high-poverty neighborhoods Female youth who moved with low-poverty income or traditional vouchers were more likely to be married than counterparts who remained in public housing in high-poverty neighborhoods Female youth younger when moved with low-poverty vouchers were less likely to be single parents than counterparts who remained in public housing in high-poverty neighborhoods Female youth older when moved with low-poverty vouchers were more likely to be single parents than counterparts who remained in public housing in high-poverty neighborhoods

(*Continued*)

Table 1 (*Continued*)

Study	Type of design	Basic design features	Sample	Outcomes examined	Findings
Yonkers Family and Community Project	7-year follow-up of quasi-experiment in Yonkers, NY	Housing assignment to new, scatter-site public housing in middle-income neighborhoods via lottery, comparison-group lottery losers and families from poor neighborhood of original public housing projects	221 African American and Latino youth ages 8–18 (ages 1–11 at time of relocation)	School engagement, school performance, math and reading achievement, behavioral problems, delinquency, substance use	Fauth et al. (2007): Older youth (15–18 years) who moved to publicly funded housing in middle-class neighborhoods had lower reported school performance and more hyperactivity problems and substance use than counterparts who remained in high-poverty neighborhoods

1992). Several other studies have followed larger samples of Gautreaux youth up to 15 years later by means of administrative data sources. One finds that youth who moved to the suburbs had established their own households in less poor and segregated neighborhoods compared with their peers who stayed in the city (Keels et al. 2005). Others report that, among male youth, moving to the suburbs was associated with a lower likelihood of drug offenses and mortality compared with staying in the city, but suburban moves were associated with female youth's greater criminal convictions compared with city stayers (Keels 2008, Votruba & Kling 2009). The long-term impacts on educational and economic attainment, however, are unknown, particularly for the larger, more representative sample.

Launched in part as a response to the promising findings from Gautreaux, MTO is the only true housing mobility experiment, as noted above. A 10-year evaluation of MTO revealed that adolescent boys who were assigned to move to low-poverty neighborhoods had worse mental health than their peers in the control group, who remained in public housing in high-poverty neighborhoods (Kessler et al. 2014). By contrast, girls whose families were given the opportunity to move to low-poverty neighborhoods had better mental health and lower rates of substance use than their peers in the control group, who stayed in high-poverty neighborhoods (Gennetian et al. 2012). Notably, these program effects were smaller than ones observed at an earlier evaluation, approximately five years after the families relocated. In general, no program effects were observed for youth in the domains of education and achievement, crime, and physical health. A longer-term young adulthood follow-up based on administrative tax return data, however, reported that children who were 13 years of age or younger when their families moved to low-poverty neighborhoods, and who presumably were exposed to more-advantaged neighborhoods earlier and longer than their older counterparts, were more likely to attend college, had higher earnings (~$3,500), and were less likely to be single parents in young adulthood than youth in the control group (Chetty et al. 2016). No such benefits were evident among MTO children who were older than 13 years when their families moved to low-poverty neighborhoods. In short, despite some promising long-run effects, on balance, MTO had limited benefits for children's development. Such results raise questions about neighborhood income/SES effects more generally, at least among samples of highly disadvantaged families living in the most distressed neighborhoods.

Some additional quasi-experiments provide evidence of a link between neighborhood socioeconomic conditions and children's development, again with mixed results. For instance, a seven-year follow-up of another housing desegregation effort in Yonkers, New York, involving approximately

220 low-income, minority youth found that youth who moved to low-rise publicly funded townhouses in primarily European American middle-class areas of the city had worse schooling and behavioral outcomes than youth from the old, high-poverty neighborhood, about half of whose families were on the waiting list for the new public housing (Fauth et al. 2007). This study also reported many null results. Other, more recent research of this sort has also shown mixed or modest results (e.g., Massey et al. 2013). Notably, one study of families in Denver public housing, where assignment of housing is quasi-random, aligns with the MTO young adulthood results (Galster & Santiago 2017).

The experimental research is in some ways consistent with the more general correlational research on neighborhood socioeconomic status and children's development in reporting modest effects, but in other ways it is less robust and somewhat more complex. This complexity arises because studies capitalizing on changes in neighborhood socioeconomic conditions as a means to limit selection bias often are confounded with other factors, such as mobility or shifts in neighborhood conditions beyond poverty, as well as other social contexts, such as schools and peers. At the same time, income and racial/ethnic differences between children/families who have moved and their new neighbors may have been a barrier to the formation of close ties and may have subjected movers to experiences of racism and discrimination. Finally, it is critical to acknowledge that in almost all studies the families remained poor despite their potentially improved neighborhood conditions (e.g., lower concentrated poverty, greater safety).

WHERE DO WE GO FROM HERE?

The neighborhoods where children live typically circumscribe their physical and social worlds. Today, children's neighborhood contexts are defined—perhaps most prominently—by rising socioeconomic inequality and segregation (Reardon & Bischoff 2016). This feature of contemporary life has profound implications for children's daily experiences and beyond. What is clear from more than 30 years of research is that neighborhood socioeconomic conditions are associated with a range of developmental outcomes. The most salient neighborhood socioeconomic condition depends on the outcome under investigation—poverty and disadvantage for social, emotional, and behavioral outcomes and affluence and advantage for achievement-related outcomes. Moreover, children's cumulative exposure to neighborhood socioeconomic conditions over the first two decades of life, and possibly especially so in childhood, may matter most for later development. In almost all cases—experimental and nonexperimental—however, these neighborhood SES effects remain modest at best. So, where do we go from here? In the remainder of this section, we cover future directions for research, policy, and practice.

Despite an emerging consensus from research on what we do know, the causal nature of documented patterns is a source of continued debate. This debate prevails because of the lack of experimental research, of studies using advanced statistical techniques to address selection bias, and of studies following both children and their neighborhood conditions over time. These gaps loom especially large in studies emanating from developmental psychology specifically as related to this topic and more generally (Duncan et al. 2004).

In addition, how documented patterns may (or may not) be shifting over time with rising social inequality and segregation is a relatively open question (e.g., Wolf et al. 2017). What also stands out is that neighborhood research is overwhelmingly based on US samples. These shortcomings also suggest future directions for research on neighborhood socioeconomic conditions and children's development. For instance, historical and comparative approaches might provide replication and robustness testing of US-based findings (Duncan et al. 2014, Nielsen et al. 2017).

They also might illuminate the range of factors implicated in this nexus, including other macro forces beyond increasing inequality and segregation, such as national policies, cultural values, and so forth.

Along these same lines, the integrated framework presented in **Figure 1** attempts to capture a broader and more dynamic approach than extant research, one that considers children's development in neighborhood contexts holistically, as is consistent with RDS models in our field. In this way, the theoretical framework is intended to guide the next generation of research in tackling not only the macro factors at play but also the social processes and resources within neighborhoods, their physical features, and the larger spatial dynamics—all of which have ramifications for children's development beyond (or in conjunction with) socioeconomic conditions. Across these various issues, more attention should be paid to individual differences as well.

These recommendations for research, namely methodologically rigorous designs, comparative approaches, and addressing the complexities of children's development in neighborhood contexts, are intended not only to bolster our understanding of this topic but also to inform policy and practice. Here, we discuss what implications can be gleaned from the research reviewed in this article. First and foremost, it remains unclear from both empirical and theoretical research whether targeting neighborhood socioeconomic conditions directly or indirectly (e.g., through resident interactions and institutional resources) is more effective at promoting children's development in neighborhood contexts. We note that, given the modest size of neighborhood SES effects and the rather mixed results from experimental studies, other targets, such as families' SES, may be more cost-effective at promoting children's development than addressing neighborhood socioeconomic conditions directly (Duncan et al. 2017). Moreover, because income inequality and residential segregation by income go hand-in-hand, policies aimed at raising low-income families' income might indirectly contribute to reducing inequalities between neighborhoods as well.

That being said, two general types of policy initiatives directly intervene to improve the socioeconomic (or related) conditions of neighborhoods in which families with children reside, usually focusing on high-poverty neighborhoods. The first strategy involves housing mobility programs such as MTO, which expand low-income families' residential options and provide them with opportunities to move from very disadvantaged neighborhoods to more advantaged ones. As reviewed above, results from these programs are mixed (**Table 1**); however, public housing authorities across the United States are implementing this strategy in a variety of ways (e.g., pegging the amount of rent covered by housing subsidies to the local market, which permits low-income families to live in more socioeconomically advantaged neighborhoods).

The second policy approach is comprehensive community initiatives (CCIs), which invest in high-poverty neighborhoods to improve current residents' living conditions (e.g., Zaff et al. 2016). Unlike housing mobility programs, which target families, CCIs focus on communities. The best-known CCI is the Harlem Children's Zone (HCZ; Harlem Children's Zone 2009), but similar efforts exist outside the United States, such as the Toronto-based Pathways program (Lavecchia et al. 2019). The HCZ initiative employs a pipeline approach, providing coordinated, community-based services in the educational, health, and social domains from the prenatal period until college. To date, evaluations of the HCZ have documented benefits for children's achievement, especially among older children (Dobbie & Fryer 2011). An outstanding question is whether the entire bundle of HCZ services is necessary, over and above charter schools, to secure the observed benefits. In light of the HCZ's success, President Obama launched the Promise Neighborhoods Initiative, a federal effort, in an attempt to replicate the HCZ across diverse communities. No systematic evaluations of these initiatives are complete, but preliminary findings suggest some progress toward improving children's academic outcomes (PolicyLink 2019).

An alternative approach is to target the indirect pathways through which neighborhood socioeconomic conditions are hypothesized to be associated with children's development, as described by the theoretical frameworks. In the case of neighborhood poverty and disadvantage, the connection among children's social, emotional, and behavioral outcomes is strongest, especially for externalizing behaviors (e.g., aggression), delinquency, and crime (e.g., Friedson & Sharkey 2015). Neighborhood disorganization and low collective efficacy are thought to be primary pathways of influence here (Leventhal et al. 2015, Sampson et al. 2002). Yet, altering neighborhood social dynamics is challenging. One promising strategy is community policing, which involves collaboration between local residents and police officers to fight crime (Corder 2014). Another one is restorative justice approaches, which attempt to foster trust and build ties within a neighborhood by enhancing social control (e.g., when authority figures respond sensitively to children's problem behaviors) and social cohesion (e.g., when family members whose children were in conflict connect with each other; e.g., Bazemore & Schiff 2015).

In the case of neighborhood affluence and advantage, the link to children's achievement outcomes is strongest (e.g., Dupéré et al. 2010). Neighborhood institutional resources are implicated as playing a prominent role in this transmission (Leventhal et al. 2015). Thus, ensuring that all children have access to institutional resources, especially high-quality preschools, schools, and youth programs, is a promising strategy, as exemplified by the HCZ (Dobbie & Fryer 2011). Enhancing institutional resources within communities may also benefit children's outcomes by strengthening neighborhood social organization.

We have made much progress over the past several decades in understanding children's development in neighborhood contexts, particularly as related to socioeconomic conditions. Clearly, there is more work to be done. As discussed above, we need better alignment between methods and theories. Only by taking up this call will we deepen our knowledge in a manner that leads to the design of better policies and practices to support children's development in neighborhood contexts in this age of inequality.

DISCLOSURE STATEMENT

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