Neighborhoods and Cognitive Development

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Abstract

Research on neighborhoods and individual well-being has produced a substantive body of knowledge over the past quarter century. Neighborhood conditions—especially socioeconomic status (SES), which is based on income and education and to a lesser extent on residential stability—are predictive of cognitive development. The strongest evidence controls for individual and family-level characteristics or examines individuals clustered within neighborhoods in order to obtain estimates of within- and between-neighborhood variance. Another line of research has focused on housing mobility projects, which allow for the experimental assignment of residents to more advantaged neighborhoods. Future research on neighborhoods will continue to blend methods and data from an increasing number of disciplines to better understand human development in context.

INTRODUCTION

In this review, we focus on cognitive development even as neighborhood research has also examined health and behavior as outcomes. In some studies, educational achievement and attainment are considered as an outcome related to cognitive development even as educational outcomes are influenced by both cognitive and noncognitive skills as well as by school and neighborhood influences. This essay examines neighborhoods but not schools, even though the two often overlap, especially during the elementary school years. In addition, neighborhood research is heavily weighted toward the study of urban rather than rural settings.

FOUNDATIONAL RESEARCH

That neighborhoods matter is not a new idea in social science (e.g., Shaw & McKay, 1942), even though debate still continues on this premise (Sampson, 2011). Above the general issue of neighborhood effects, the primary questions

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are "How?," "How much?," "For what outcomes?," and "For what groups?" These are challenging to answer, however, given two confounding questions. "Do people not choose where they live?" renders neighborhood effects to be individual selection effects. This, in turn, establishes what has been the baseline for neighborhood research since, "Do neighborhoods matter above and beyond individual-level factors?" A sizable body of research has been produced in response, with a number of reviews condensing findings and highlighting ongoing challenges (e.g., Chen & Brooks-Gunn, 2012; Leventhal & Brooks-Gunn, 2000). In a similar vein, we present here key research findings from the past quarter century.

How Are Neighborhoods Studied?

While some researchers use neighborhood data as a proxy for individual data, only studies considering the unique contributions of neighborhoods will be discussed here. Such data are considered "nested," given that individuals reside within neighborhoods. This requires both multilevel modeling of the data and significantly larger sample sizes to provide adequate statistical power. To find such numbers, large-scale existing data sets from long-standing studies (e.g., the Panel Study of Income Dynamics or the Infant Health and Development Program, Brooks-Gunn, Duncan, Klebanov, & Sealand, 1993) or administrative sources (e.g., school grades, Garner & Raudenbush, 1991) are used. Even better are studies that sample neighborhoods and then sample individuals, families, or households within neighborhoods (e.g., the Project on Human Development in Chicago Neighborhoods, Sampson, 2011).

It should be noted that by "neighborhoods," we refer to the geographic area in which a person lives rather than the social network to which a person belongs. In research, these geographic areas are administrative units such as census tracts or school catchment areas for which data already exist and have been collected, typically by government agencies (e.g., the US Census Bureau). While research that incorporates novel neighborhood measures or resident-defined geographic units exists, these studies are in the minority and represent a limitation of neighborhood research that is discussed in our section on future directions. Few studies have attempted to validate the designation of neighborhoods by census tracts with resident-defined units (e.g., Sampson, 2011).

Similarly, measures of cognitive development include traditional intelligence, achievement, and language tests (e.g., the Woodcock–Johnson Achievement Tests in Sharkey & Elwert, 2011). A number of studies also consider school-based assessments (e.g., the California Achievement Test in Entwisle, Alexander, & Olson, 1994) and criteria including graduation

and dropout (Brooks-Gunn *et al*., 1993). While a limited number of studies researched neighborhood effects on adults (e.g., Sheffield & Peek, 2009), most studies linking neighborhoods to cognition focus on the developmental aspects experienced during childhood and through adolescence.

Neighborhood Advantage/Disadvantage

Neighborhood socioeconomic status (SES) consistently predicts cognitive development. A strong qualitative and demographic research base exists linking concentrated disadvantage and racial segregation to negative life outcomes (Massey & Denton, 1993). These findings hold true even after controlling for individual- and family-level characteristics, and indicate that additional dynamics in the community shape individual development. For instance, Crane (1991) found the percentage of neighborhood residents with professional or managerial jobs to be a stronger predictor of high school dropout than a number of negative indicators such as unemployment, poverty, and middle school dropout. Such results are found in children as early as preschool (Duncan, Brooks-Gunn, & Klebanov, 1994; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998). And while earlier US studies tended to focus on whites and African-Americans, more recent studies have replicated previous findings in samples with larger immigrant populations (Leventhal, Xue, & Brooks-Gunn, 2006), as well as in samples outside the United States (Garner & Raudenbush, 1991; Kohen, Brooks-Gunn, Leventhal & Hertzman, 2002).

A recurring question researchers have raised is whether SES should be considered to be nonlinear and measured as affluence and poverty. For example, in an analysis of two US data sets, poverty was linked to increased internalizing and externalizing behavior in young children, but it was affluence that predicted IQ scores at age 5 (Duncan *et al*., 1994). A more recent study utilizing Head Start data found poverty rather than affluence to significantly predict poorer cognitive performance on a picture vocabulary test (Vaden-Kiernan *et al*., 2010). This finding should be interpreted with caution, however, as children enrolled in Head Start by definition come from poorer families, limiting generalizability.

Given the connections between neighborhoods and cognitive development, it is not surprising that neighborhood SES also predicts educational attainment and attitudes. In an early study utilizing multilevel methods to analyze Scottish high school data, neighborhood poverty (as well as unemployment, single-parent households, overcrowding, and chronic illness) was linked to poorer educational attainment controlling for individual, family, and school-level factors (Garner & Raudenbush, 1991). Returning to our question regarding poverty versus affluence, another study using US census

data linked high school dropout rates more strongly to a single measure of affluence (the number of neighborhood residents holding managerial or professional jobs) than any measure of poverty (Crane, 1991). More recent research continues to offer support for both affluence (e.g., Ainsworth, 2002) and poverty (South, Baumer, & Lutz, 2003) predicting educational attainment.

Researchers have also studied why these links exist. Such research, focusing more on behavioral and attitudinal data, has often been linked to educational attainment as opposed to simply cognitive assessment. Living in more affluent neighborhoods has been associated with more exposure to more advanced maternal speech for developing children (Hoff, 2003). Additional high-status residents might also result in the collective socialization of youth to spend more time on homework and attend schools with better atmosphere (Ainsworth, 2002). Neighborhood affluence might also encourage increased parental material investment in the home (Duncan *et al.*, 1994) or higher rates of participation in institutional resources such as after-school lessons and summer camps (Dearing *et al.*, 2009). These are more positively nuanced perspectives than Crane's (1991) contagion theory that held that urban neighborhoods with the lowest concentrations of high-status residents saw disproportionately large effect sizes. Other research utilizing the National Survey of Children found that the neighborhood effects of poverty could be explained by peer educational attitudes (South *et al.*, 2003). From a material perspective, individuals living in poverty might also experience a psychological sense of relative economic deprivation with one study finding that attainment is more strongly predicted by neighborhood income inequality as opposed to only absolute poverty (Turley, 2002).

Gender differences have also emerged in several studies. In a sample of elementary school students in Baltimore, neighborhood income and parent education levels were stronger predictors for math scores for boys than for girls (Entwisle *et al.*, 1994). And as will be discussed later, a group of adolescent girls moving out of highly disadvantaged public housing in Baltimore saw some improvement in cognitive performance (Sanbonmatsu, Kling, Duncan, & Brooks-Gunn, 2006). Similarly, neighborhood occupational status was found to predict lower rates of high school dropout for boys but not for girls in a 30-year study of poor Chicago youth (Ensminger, Lamkin, & Jacobson, 1996).

With regard to race, it should be noted that it is difficult to interpret different effects of SES by ethnicity/race as the two predictors remain highly correlated (Clampet-Lundquist & Massey, 2008). Still, limited evidence of SES by ethnicity/race interactions does exist. In two large US data sets, neighborhood affluence was found to be a stronger protective factor for white adolescents than for black adolescents in predicting high school

dropout (Brooks-Gunn *et al*., 1993). Later analyses of these data found that living in neighborhoods with higher concentrations of African-Americans mitigated these racial differences (Turley, 2003). Similarly, immigrant status was associated with larger negative neighborhood effects for SES in predicting school grades (Pong & Hao, 2007).

Housing Mobility Programs

Even as early neighborhood research consistently found links to cognitive development controlling for individual-level data, criticism regarding individuals selecting to live in certain neighborhoods remained. A unique opportunity to address this arose, however, in the form of housing mobility programs. Originally mandated through court order in cities such as Chicago (Rosenbaum, 1995) and Yonkers (Briggs, 1998), these programs sought to move residents out of highly disadvantaged neighborhoods. Despite the lack of randomized assignment, early results from the Gautreaux housing program in Chicago were promising, as black youth who moved to predominantly white suburbs did significantly better in school with regard to difficulty of classes taken, graduation, and college enrollment (Rosenbaum, 1995).

As a result of these findings, a large-scale housing experiment, the Moving to Opportunity (MTO) Program, was initiated by the US Department of Housing and Urban Development. Taking place in five major US cities (Baltimore, Boston, Chicago, Los Angeles, and New York), 4600 families were randomly assigned to receive housing vouchers, vouchers and additional housing assistance, or no vouchers. Data from families were collected at baseline and then 2 years and 5 years following the move. After 2 years, initial results found benefits for moving to better neighborhoods for children with regard to behavioral outcomes (Katz, Kling, & Liebman, 2001; Leventhal & Brooks-Gunn, 2003). Improved cognitive performance was seen in youth from one MTO city (Baltimore) at 2 years, but these were found to have faded by year 5 (Ludwig, Ladd, & Duncan, 2001). MTO effects in New York City after 2 years were the opposite of Baltimore, however, with adolescent movers reporting lower school grades and engagement (Leventhal, Fauth, & Brooks-Gunn, 2005). After 5 years, no differences in cognitive functioning using a standardized non-school-based assessment were found in analyses of the pooled MTO sample except for African-American youth (Sanbonmatsu *et al*., 2006). The only school-related benefits found were for girls and for school-based behavior rather than cognitive performance (Kling, Liebman, & Katz, 2007).

Possible reasons for poor findings from MTO include poor program uptake by both the voucher only group (48%) and the voucher and assistance group (60%) (Goering *et al*., 1999). Furthermore, a number of participants who

did not receive the voucher in the MTO study moved of their own accord anyway, which should not be surprising given that all participants applied to enter the voucher lottery at the beginning of the study (Clampet-Lundquist & Massey, 2008). Even if families did move, the schools in MTO participants' new neighborhoods were only marginally better, performing on average at the 19th percentile compared to the 15th percentile for the control group, indicating minimal, if any, improvement (Sanbonmatsu *et al*., 2006). A similar argument can be made with regard to neighborhood SES as families were moving into less poor but not affluent neighborhoods, supporting the argument that it is affluence rather than poverty that predicts cognitive performance. One final possibility is that school-level differences presented a unique set of challenges, as children who moved had higher retention and dropout rates (Sanbonmatsu *et al*., 2006) in more racially segregated schools (Clampet-Lundquist & Massey, 2008).

The lack of lasting significant positive findings was also the case in Yonkers, where court-ordered residential desegregation led to a public backlash against efforts to simultaneously desegregate schools (Briggs, 1998). As a result, most Yonkers youth attended schools in their original neighborhoods, reducing the potential benefits of the new neighborhoods as students felt less connected to their schools (Fauth, Leventhal, & Brooks-Gunn, 2007). After the seemingly positive initial findings from Gautreaux, the nonsignificant and negative findings from Yonkers and MTO challenge researchers and policymakers to identify adjustments or new solutions in the face of continued neighborhood segregation and disadvantage (Sampson, 2012).

CUTTING-EDGE RESEARCH

Recent research on neighborhood effects has sought to broaden operationalization of neighborhood disadvantage and consider additional variables. One study of black adolescents from Georgia and Iowa found that neighborhood physical disorder was a unique predictor of college aspirations (Stewart, Stewart, & Simons, 2007). Another study of older adults in 65 Baltimore neighborhoods, linked data on social disorganization, physical disorder, and public safety in addition to economic conditions to more rapid cognitive impairment (Lee, Glass, James, Bandeen-Roche, & Schwartz, 2011). In addition, individual aspects of neighborhood disadvantage are now being considered apart from overall SES. For instance, the percentage of adults in a neighborhood with at least a high school diploma has been associated with higher cognitive functioning in adults, controlling for individual-level educational attainment (Wight *et al*., 2006). Recent analyses of homicide data in Chicago neighborhoods found that having a homicide occur in the

same census block group in which one lives predicted lower performance on standardized school tests (Sharkey, 2010).

Moving away from a deficit-based model of thinking, protective factors such as residential stability have been found to have positive links to educational attainment (South *et al*., 2003), although such studies have tended to find residential stability to be correlated with socioeconomic status. In a Canadian sample of preschoolers, low social cohesion was found to operate uniquely from affluence in predicting child verbal ability (Kohen *et al*., 2002). Another proxy for social cohesion has been increased neighborhood concentration by ethnic group. In a sample of Mexican-Americans in the southwestern United States, living in a neighborhood with a higher percentage of Mexican-Americans was associated with lower cognitive impairment (Sheffield & Peek, 2009).

New longitudinal research has also taken advantage of intergenerational data and new statistical methods. Independent of individual-level poverty, children whose families have lived in high-poverty neighborhoods for more than one generation were associated with even higher deficits in cognitive ability (Sharkey & Elwert, 2011). These findings are especially troubling for black children whose families are more likely to live in neighborhoods with higher rates of multigenerational poverty. Researchers have also sought more dynamic measures of neighborhood characteristics, which have been traditionally chronologically fixed in 10-year intervals because of the US Census. By considering annual rather than decennial trends in neighborhood disadvantage, Wodtke, Harding, and Elwert (2011) were able to better control for neighborhood selection, improving estimates of the negative consequences of neighborhood disadvantage.

With US and global populations that are living longer on average, greater consideration must be given to cognitive development in older populations. In contrast to children, cognitive development in older adults represents maintaining cognitive performance and avoiding deterioration. As already alluded to, poor neighborhood conditions have been linked with more rapid cognitive decline both in the United States (Espino, Lichtenstein, Palmer & Hazuda, 2001) and abroad (Lang *et al*., 2008). Neighborhood disadvantage has also been tied to the gene by environment interactions (Lee *et al*., 2011) and neighborhood ethnic composition for ethnic minorities as well (Sheffield & Peek, 2009).

KEY ISSUES FOR FUTURE RESEARCH

Ongoing neighborhood research will continue to wrestle with a number of ongoing challenges even as new methods and data provide for creative solutions.

Selection

Nonexperimental neighborhood research will continue to struggle with the challenge of selection. New statistical and modeling methods must be adopted into neighborhood research. Propensity score matching represents one approach to controlling for neighborhood selection (Lee *et al.*, 2011). Such methods use variables typically used as controls or predictors of neighborhood selection to match participants who share the same likelihood of living in a certain type of neighborhood but in fact do not. Another study utilizing Swedish data, used sibling data to control for home environment and test for differences across neighborhoods as families moved or stayed in the same neighborhood (Lindahl, 2011). The need to account for selection is increasingly important as neighborhoods continue to become more segregated (Sampson, 2012) with evidence of increasing residential selection based on factors such as SES (Sawhill & McLanahan, 2006), race (Bayer, Ferreira, & McMillan, 2007), immigrant status (Lauen, 2007), and school quality (DeSena, 2006).

Collinearity

Even as neighborhood researchers consider multiple and cross-classified levels of nesting, it is possible that factors existing at several levels (e.g., poverty) are collinear across levels. That is, given that most measures of neighborhood poverty are simply the aggregation of individual-level poverty, these two predictors are dependent on one another, which in turn will potentially bias parameter estimates (Oakes, 2004). Others have argued, however, that existing methods of modeling multilevel data provide more conservative estimates of neighborhood effects by giving primacy (theoretically and statistically) to individual-level data (Duncan & Raudenbush, 1999).

Operationalizing Neighborhoods

Neighborhoods are a challenge to define and operationalize whether one is a resident, a researcher, or a policymaker (Coulton, Korbin, Chan, & Su, 2001). Researchers have struggled to define neighborhood boundaries using administrative units (Sampson, 2012), property lines (Clapp & Wang, 2006), walking distances (Sturm, 2008), or even natural geographic boundaries (Hoxby, 2000). Additional research has sought to understand shifting patterns within neighborhoods (Sampson & Sharkey, 2008), and the potential for adjoining neighborhoods to influence one another (Morenoff, 2003). It is also possible that definitions of neighborhoods and the size or type of neighborhood needed to influence cognitive development might vary by

specific outcome, age, or even from region to region (e.g., Chase-Lansdale & Gordon, 1996).

Cross-Classification

People change residences from neighborhood to neighborhood across time, and they also can move from neighborhood to neighborhood for employment and school. While early neighborhood studies could not account for such movement (e.g., Garner & Raudenbush, 1991), researchers have begun to utilize cross-classified models to consider student movement across neighborhoods and between schools (Luo & Kwok, 2012). Furthermore, consideration of contextual factors must also distinguish between school-based and neighborhood-based factors to correctly attribute variance to different predictors beyond only family factors (Aikens & Barbarin, 2008; Whipple, Evans, Barry, & Maxwell, 2010).

Development Across Domains

Researchers have also found links between neighborhoods and a number of other developmental domains including socioemotional functioning and physical and sexual health. These associations represent potential indirect pathways through which neighborhoods can influence cognitive development. For instance, teenage childbearing has been linked with not only high school dropouts (Brooks-Gunn *et al*., 1993; Crane, 1991) but multigenerational poverty that will be associated with cognitive deficits in the next generation (Sharkey & Elwert, 2011). For younger children, neighborhood disadvantage is associated with higher levels of internalizing and externalizing behaviors (Xue, Leventhal, Brooks-Gunn, & Earls, 2005) and child dietary intake (Florence, Asbridge, & Veugelers, 2008) and air pollution (Pastor, Sadd, & Morello-Frosch, 2004), which, in turn, have been linked to lower cognitive functioning for children.

Mixed Methods Research Across Disciplines

Qualitative methods can help researchers identify future variables of interest as well as anecdotal accounts for why existing relationships might be significant (Turney, Clampet-Lundquist, Edin, Kling & Duncan, 2006). This will be especially critical in designing future neighborhood experiments. Similarly, opportunities for natural experiments, as was the case with Gautreaux, should be sought out as policymakers continue to weigh the merit of highly concentrated public housing for the poor (Currie & Yelowitz, 2000).

CONCLUSION

Taken together, neighborhood research finds that cognitive development and performance are linked to neighborhood-level predictors. Altering these trajectories through experiments and policies, however, remains challenging. Future research will best be served by continued collaboration between disciplines and replication of existing findings in new contexts even as additional variables are considered.

REFERENCES

Aikens, N. L., & Barbarin, O. (2008). Socioeconomic differences in reading trajectories: The contribution of family, neighborhood, and school contexts. *Journal of Educational Psychology*, *100*, 235–251.

Ainsworth, J. W. (2002). Why does it take a village? The mediation of neighborhood effects in educational achievement. *Social Forces*, *81*, 117–152.

Bayer, P., Ferreira, F., & McMillan, R. (2007). A unified framework for measuring preferences for schools and neighborhoods. *Journal of Political Economy*, *115*, 588–638.

Briggs, X. D. (1998). Brown kids in white suburbs: Housing mobility and the many faces of social capital. *Housing Policy Debate*, *9*, 177–221.

Brooks-Gunn, J., Duncan, G. J., Klebanov, P. K., & Sealand, N. (1993). Do neighborhoods influence child and adolescent development? *American Journal of Sociology*, *99*, 353–395.

Chase-Lansdale, L. P., & Gordon, R. A. (1996). Economic hardship and the development of five- and six-year-olds: Neighborhood and regional perspectives. *Child Development*, *67*, 3338–3367.

Chen, J. J., & Brooks-Gunn, J. (2012). Neighborhoods, schools, and achievement. In K. R. Harris, S. Graham, T. Urdan, S. Graham, J. M. Royer & M. Zeidner (Eds.), *APA educational psychology handbook, Vol. 2: Individual differences and cultural and contextual factors* (pp. 337–360). Washington, DC: American Psychological Association.

Clampet-Lundquist, S., & Massey, D. S. (2008). Neighborhood effects on economic self-sufficiency: A reconsideration of the moving to opportunity experiment. *American Journal of Sociology*, *114*, 107–143.

Clapp, J. M., & Wang, Y. Z. (2006). Defining neighborhood boundaries: Are census tracts obsolete? *Journal of Urban Economics*, *59*, 259–284.

Coulton, C. J., Korbin, J., Chan, T., & Su, M. (2001). Mapping residents' perceptions of neighborhood boundaries: A methodological note. *American Journal of Community Psychology*, *29*, 371–383.

Crane, J. (1991). The epidemic theory of ghettos and neighborhood effects on dropping out and teenage child-bearing. *American Journal of Sociology*, *96*, 1226–1260.

Currie, J., & Yelowitz, A. (2000). Are public housing projects good for kids? *Journal of Public Economics*, *112*, 99–124.

Dearing, E., Wimer, C., Simpkins, S. D., Lund, T., Bouffard, S. M., Caronongan, P. … Weiss, H. (2009). Do neighborhood and home contexts help explain why low-income children miss opportunities to participate in activities outside of school? *Developmental Psychology*, *45*, 1545–1562.

DeSena, J. N. (2006). "What's a mother to do?" Gentrification, school selection, and the consequences for community cohesion. *American Behavioral Scientist*, *50*, 241–257.

Duncan, G. J., Brooks-Gunn, J., & Klebanov, P. K. (1994). Economic deprivation and early childhood development. *Child Development*, *65*, 296–318.

Duncan, G. J., & Raudenbush, S. W. (1999). Assessing the effects of context in studies of child and youth development. *Educational Psychologist*, *34*, 29–41.

Ensminger, M. E., Lamkin, R. P., & Jacobson, N. (1996). School leaving: A longitudinal perspective including neighborhood effects. *Child Development*, *67*, 2400–2416.

Entwisle, D. R., Alexander, K. L., & Olson, L. S. (1994). The gender gap in math: Its possible origins in neighborhood effects. *American Sociological Review*, *59*, 822–838.

Espino, D. V., Lichtenstein, M. J., Palmer, R. F., & Hazuda, H. P. (2001). Ethnic differences in Mini-Mental State Examination (MMSE) scores: Where you live makes a difference. *Journal of the American Geriatrics Society*, *49*, 538–548.

Fauth, R. C., Leventhal, T., & Brooks-Gunn, J. (2007). Welcome to the neighborhood? Long- term impacts of moving to low-poverty neighborhoods on poor children's and adolescents' outcomes. *Journal of Research on Adolescence*, *17*, 249–284.

Florence, M. D., Asbridge, M., & Veugelers, P. J. (2008). Diet quality and academic performance. *Journal of School Health*, *78*, 209–215.

Garner, C. L., & Raudenbush, S. W. (1991). Neighborhood effects on educational attainment: A multilevel analysis. *Sociology of Education*, *64*, 251–262.

Goering, J., Kraft, J., Feins, J. D., McInnis, D., Holin, M. J., & Elhassan, H. (1999). *Moving to opportunity for fair housing demonstration program: Current status and initial findings*. Washington, DC: US Department of Housing and Urban Development.

Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, *74*, 1368–1378.

Hoxby, C. M. (2000). Does competition among public schools benefit students and taxpayers? *American Economic Review*, *90*, 1209–1238.

Katz, L. F., Kling, J. R., & Liebman, J. B. (2001). Moving to opportunity in Boston: Early results of a randomized mobility experiment. *Quarterly Journal of Economics*, *116*, 607–654.

Klebanov, P. K., Brooks-Gunn, J., McCarton, C., & McCormick, M. C. (1998). The contribution of neighborhood and family income to developmental test scores over the first three years of life. *Child Development*, *69*, 1420–1436.

Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econometrica*, *75*, 83–119.

Kohen, D. E., Brooks-Gunn, J., Leventhal, T., & Hertzman, C. (2002). Neighborhood income and physical and social disorder in Canada: Associations with young children's competencies. *Child Development*, *73*, 1844–1860.

Lang, I. A., Llewellyn, D. J., Langa, K. M., Wallace, R. B., Huppert, F. A., & Melzer, D. (2008). Neighborhood deprivation, individual socioeconomic status, and cognitive function in older people: Analyses from the english longitudinal study of ageing. *Journal of the American Geriatric Society*, *56*, 191–198.

Lauen, D. L. (2007). Contextual explanations of school choice. *Sociology of Education*, *80*, 179–209.

Lee, B. K., Glass, T. A., James, B. D., Bandeen-Roche, K., & Schwartz, B. S. (2011). Neighborhood psychosocial environment, apolipoprotein E genotype, and cognitive function in older adults. *Archives of General Psychiatry*, *68*, 314–321.

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*, *126*, 309–337.

Leventhal, T., & Brooks-Gunn, J. (2003). Moving to opportunity: An experimental study of neighborhood effects on mental health. *American Journal of Public Health*, *93*, 1576–1582.

Leventhal, T., Fauth, R. C., & Brooks-Gunn, J. (2005). Neighborhood poverty and public policy: A 5-year follow-up of children's educational outcomes in the New York City moving to opportunity demonstration. *Developmental Psychology*, *41*, 933–952.

Leventhal, T., Xue, Y., & Brooks-Gunn, J. (2006). Immigrant differences in school-age children's verbal trajectories: A look at four racial/ethnic groups. *Child Development*, *77*, 1359–1374.

Lindahl, L. (2011). A comparison of family and neighborhood effects on grades, test scores, educational attainment and income—evidence from Sweden. *Journal of Economic Inequality*, *9*, 207–226.

Ludwig, J., Ladd, H. F., & Duncan, G. J. (2001). Urban poverty and educational outcomes. *Brookings-Wharton Papers on Urban Affairs*, *21*, 147–201.

Luo, W., & Kwok, O. (2012). The consequences of ignoring individuals' mobility in multilevel growth models: A Monte Carlo study. *Journal of Educational and Behavioral Statistics*, *37*, 31–56.

Massey, D. S., & Denton, N. A. (1993). *American apartheid: Segregation and the making of the underclass*. Cambridge, MA: Harvard University Press.

Morenoff, J. D. (2003). Neighborhood mechanisms and the spatial dynamics of birthweight. *American Journal of Sociology*, *108*, 976–1017.

Oakes, J. M. (2004). The (mis)estimation of neighborhood effects: Causal inference for a practicable social epidemiology. *Social Science Medicine*, *58*, 1929–1952.

Pastor, M., Sadd, J. L., & Morello-Frosch, R. (2004). Reading, writing, and toxics: children's health, academic performance, and environmental justice in Los Angeles. *Environment and Planning C: Government and Policy*, *22*, 271–290.

Pong, S. L., & Hao, L. X. (2007). Neighborhood and school factors in the school performance of immigrants' children. *International Migration Review*, *41*, 206–241.

Rosenbaum, J. E. (1995). Changing the geography of opportunity by expanding residential choice: Lessons from the Gautreaux Program. *Housing Policy Debate*, *6*, 231–269.

Sampson, R. J. (2011). *Great American city: Chicago and the enduring neighborhood effect*. Chicago, IL: University of Chicago Press.

Sampson, R. J. (2012). Moving and the neighborhood glass ceiling. *Science*, *337*, 1464–1465.

Sampson, R. J., & Sharkey, P. (2008). Neighborhood selection and the social reproduction of concentrated racial inequality. *Demography*, *45*, 1–29.

Sanbonmatsu, L., Kling, J. R., Duncan, G. J., & Brooks-Gunn, J. (2006). Neighborhoods and academic achievement. *Journal of Human Resources*, *41*, 649–691.

Sawhill, I., & McLanahan, S. (2006). Opportunity in America: Introducing the issue. *The Future of Children*, *16*, 3–17.

Sharkey, P. (2010). The acute effect of local homicides on children's cognitive performance. *Proceedings of the National Academies of Science*, *107*, 11733–11738.

Sharkey, P., & Elwert, F. (2011). The legacy of disadvantage: Multigenerational neighborhood effects on cognitive ability. *American Journal of Sociology*, *116*, 1934–1981.

Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago, IL: University of Chicago Press.

Sheffield, K. M., & Peek, M. K. (2009). Neighborhood context and cognitive decline in older Mexican Americans: Results from the Hispanic established populations for epidemiologic studies of the elderly. *American Journal of Epidemiology*, *169*, 1092–1101.

Stewart, E. B., Stewart, E. A., & Simons, R. L. (2007). The effect of neighborhood context on the college aspirations of African American adolescents. *American Educational Research Journal*, *44*, 896–919.

South, S. J., Baumer, E. P., & Lutz, A. (2003). Interpreting community effects on youth educational attainment. *Youth & Society*, *35*, 3–36.

Sturm, R. (2008). Disparities in the food environment surrounding US middle and high schools. *Public Health*, *122*, 681–690.

Turley, R. N. L. (2002). Is relative deprivation beneficial? The effects of richer and poorer neighbors on children's outcomes. *Journal of Community Psychology*, *30*, 671–686.

Turley, R. N. L. (2003). When do neighborhoods matter? The role of race and neighborhood peers. *Social Science Research*, *32*, 61–79.

Turney, K., Clampet-Lundquist, S., Edin, K., Kling, J. R., & Duncan, G. J. (2006). Neighborhood effects on barriers to employment: Results from a randomized housing mobility experiment in Baltimore. In G. Burtless & J. R. Pack (Eds.), *Brookings-Wharton papers on urban affairs* (pp. 137–187). Washington, DC: Brookings Institution Press.

Vaden-Kiernan, M., D'Elio, M. A., O'Brien, R. W., Tarullo, L. B., Zill, N., & Hubbell-McKey, R. (2010). Neighborhood as a developmental context: A multilevel analysis of neighborhood effects on head start families and children. *American Journal of Community Psychology*, *45*, 49–67.

Whipple, S. S., Evans, G. W., Barry, R. L., & Maxwell, L. E. (2010). An ecological perspective on cumulative school and neighborhood risk factors related to achievement. *Journal of Applied Developmental Psychology*, *31*, 422–427.

Wight, R. G., Aneshensel, C. S., Miller-Martinez, D., Botticello, A. L., Cummings, J. R., Karlamangla, A. S., & Seeman, T. E. (2006). Urban neighborhood context, educational attainment, and cognitive function among older adults. *American Journal of Epidemiology*, *163*, 1071–1078.

Wodtke, G. T., Harding, D. J., & Elwert, F. (2011). Neighborhood effects in temporal perspective: The impact of long-term exposure to concentrated disadvantage on high school graduation. *American Sociological Review*, *76*, 713–736.

Xue, Y. G., Leventhal, T., Brooks-Gunn, J., & Earls, F. J. (2005). Neighborhood residence and mental health problems of 5- to 11-year-olds. *Archives of General Psychiatry*, *62*, 554–563.

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