

The Neighborhoods They Live in: The Effects of Neighborhood Residence on Child and Adolescent Outcomes

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This article provides a comprehensive review of research on the effects of neighborhood residence on child and adolescent well-being. The first section reviews key methodological issues. The following section considers links between neighborhood characteristics and child outcomes and suggests the importance of high socioeconomic status (SES) for achievement and low SES and residential instability for behavioral/emotional outcomes. The third section identifies 3 pathways (institutional resources, relationships, and norms/collective efficacy) through which neighborhoods might influence development, and which represent an extension of models identified by C. Jencks and S. Mayer (1990) and R. J. Sampson (1992). The models provide a theoretical base for studying neighborhood mechanisms and specify different levels (individual, family, school, peer, community) at which processes may operate. Implications for an emerging developmental framework for research on neighborhoods are discussed.

Social science concerns about the effects of residence in a poor neighborhood on children and youth date back more than 50 years to the publication of Shaw and McKay's (1942) *Juvenile Delinquency and Urban Areas*. Historical accounts of the effects of living in a poor neighborhood date back even further. The current interest in neighborhood effects on children and youth has multiple origins. First, Wilson's (1987) documentation of increasingly concentrated poverty in urban areas at the neighborhood level during the 1970s and 1980s served to reorient discussions of poverty from the individual to the neighborhood level. Second, and related to the work of Wilson, was the rejuvenated interest among sociologists and urban scholars in community social disorganization theory (Shaw & McKay, 1942) as an explanatory model for delinquency and crime, as well as other problem behaviors encountered in many poor urban neighborhoods (see, e.g., Bursik, 1988; Kornhauser, 1978; Sampson, 1992; Sampson & Groves, 1989; see Sampson & Morenoff, 1997, for a review). Social disorganization theory posits that neighborhood structural factors, such as poverty, residential instability, single parenthood, and ethnic heterogeneity, are of prime importance in explaining behavior through their ability to thwart or promote neighborhood organization (formal and informal institutions), which maintains public order.

Other scholars, although not necessarily focusing on child well-being, drew attention to residential (or spacial) patterns as sources

of concentrated neighborhood poverty. Specifically, Massey and colleagues (Massey, 1990, 1996; Massey & Denton, 1993) pointed to housing policies as a major contributor to concentrated poverty, as well as racial segregation more generally (in contrast to Wilson, 1987, who discussed economic segregation within race). These researchers have argued that the segregation of public housing in predominantly poor neighborhoods led to isolated areas of concentrated poverty in the cities and, at the same time, to growing areas of concentrated affluence, predominantly outside the cities (Massey, 1996). Further, because high concentrations of minorities reside in poor urban neighborhoods, such policies have promoted racial and ethnic segregation of neighborhoods because European Americans are more likely to live in areas of concentrated affluence outside the cities. The result of this economic and social segregation is that African Americans residing in poor urban neighborhoods have been disproportionately affected by the large increases in centralized poverty because fewer neighborhoods (primarily those located within urban areas) have been affected by the demographic changes during the 1970s and 1980s (Massey, 1990; see also Wilson, 1987).

The fourth development in neighborhood research was the publication of the now-classic review of neighborhood effects by Jencks and Mayer (1990), in which they identified five theoretical frameworks for linking individual behavior with neighborhood effects. The five models included (a) *neighborhood institutional resource models*, which posit that neighborhood resources may affect children through police presence and access to resources that provide stimulating learning and social environments, such as parks, libraries, and community centers, as well as community services that promote healthy development; (b) *collective socialization models* of neighborhoods, which propose that neighborhood influences affect children by means of community social organization, including the presence of adult role models, supervision, and monitoring, in addition to structure and routines; (c) *contagion (or epidemic) models*, which focus on problem behavior and are based on the premise that the negative behavior of neighbors and peers strongly influences or spreads to the behavior of

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others; (d) *models of competition*, which suggest that neighbors or peers compete for scarce community resources; and (e) *relative deprivation models*, which posit that neighborhood conditions affect individuals by means of their evaluation of their own situation relative to neighbors or peers. Since their introduction, these models have guided theoretical discussions of neighborhood influences on children and youth.

The acceptance of more contextual frameworks in developmental psychology, as epitomized by Bronfenbrenner (1979), further energized interest in neighborhood effects on children and adolescents. This perspective of human development emphasizes viewing lives in context and the need for researchers to examine the multiple contexts that influence children and families (e.g., schools/child care, peers, communities), as well as the relations among these contexts. A concomitant theoretical development was the acceptance of bidirectional effects and person–context interactions (Bronfenbrenner, 1989). Specifically, not only do contexts influence individuals but also individual characteristics influence or often form the contexts in which individuals interact (Aber, Gephart, Brooks-Gunn, Connell, & Spencer, 1997).

Attention to neighborhood poverty was also fostered by a growing interest among developmentalists in the mechanisms through which so-called risk factors, such as neighborhood poverty, and protective factors, such as neighborhood affluence, operate. Also, the growing recognition that it is not just single risk or protective factors but the accumulation of such factors that is likely to result in negative or positive child and family outcomes was applied to family- and neighborhood-level analyses (Rutter, 1989; Rutter, Champion, Quinton, Maughan, & Pickles, 1995; Sameroff, Seifer, Baldwin, & Baldwin, 1993; Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987; Werner & Smith, 1982; see also Brooks-Gunn, Klebanov, & Liaw, 1994; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; and Liaw & Brooks-Gunn, 1994). Risk and protective factors occur at multiple levels—individual, family, peer group, school, and neighborhood; the effects of each may vary for particular subgroups of children or families (Caspi & Moffitt, 1991; Graber & Brooks-Gunn, 1996; Rutter, 1987).

In the past decade, the convergence of these multiple strands of research led to a miniature explosion of research on neighborhood influences on children and youth. This point is illustrated by the publication of two volumes on neighborhood poverty by the Social Science Research Council's Working Group on Communities and Neighborhoods, Family Processes, and Individual Development (*Neighborhood Poverty: Context and Consequences for Children and Neighborhood Poverty: Policy Implications in Studying Neighborhoods*, edited by Brooks-Gunn, Duncan, & Aber, 1997a, 1997b), as well as a recent volume based on work of the MacArthur Foundation's Research Network on Successful Adolescent Development Among Youth in High Risk Settings (*Managing to Make It: Urban Families and Adolescent Success*, edited by Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999).

Drawing on the historical, theoretical, and empirical influences outlined, this article addresses three important questions about neighborhood effects on children and youth. In the first section, *How Are Neighborhoods Studied?*, key methodological issues are reviewed, including study designs, strategies for defining neighborhoods, and identification of neighborhood dimensions. In addition, important analytic concerns in neighborhood research are discussed. The following section, *Do Neighborhoods Matter for*

Children and Youth?, provides a review of the current knowledge about neighborhood effects on children and adolescents, in essence picking up from the review by Jencks and Mayer (1990). The outcomes considered are school readiness and achievement, behavioral and emotional problems, and sexuality and childbearing. In the third section, *How Do Neighborhoods Influence Children and Youth?*, the different pathways through which neighborhoods may influence children and adolescents are presented. These mechanisms include institutional resources, relationships, and norms/collective efficacy. These potential pathways of neighborhood influence represent an extension of the models identified by Jencks and Mayer. The goal of this reformulated framework is to assist future theoretical inquiries into and analytic explorations of the processes through which neighborhood influences operate. To this end, first, we consolidate theoretical models that overlap in their specification of pathways of neighborhood influence, such as peers (contagion and collective socialization) or community resources (resources and competition). Further, we identify the different levels at which mechanisms of influence may occur—individual, parent/family, peer group, school, or community. Thus, our models, although fewer than those outlined by Jencks and Mayer, are expanded in terms of their theoretical development and level of specificity. In the concluding section, implications for an emerging developmental framework on the significance of neighborhoods are discussed, including the use of census data and alternative methodologies, the most appropriate designs, selection of neighborhood dimensions, and potential confounds. In essence, we provide recommendations for the next generation of neighborhood researchers.

How Are Neighborhoods Studied?

In this section, we cover various approaches to designing neighborhood studies and the strengths and weaknesses of these approaches. Next, strategies for defining neighborhoods and identifying neighborhood dimensions are examined. Then, we discuss the importance of considering family characteristics in addition to neighborhood characteristics and problems of selection bias that arise in neighborhood research. Alternative analytic approaches are also discussed.

Approaches to Designing Studies

To date, four basic designs have been used to study neighborhood effects on children and youth: (a) national or multisite large studies, (b) city or regional studies, (c) neighborhood-based designs, and (d) experimental or quasi-experimental designs. A description of these approaches follows.

National or multisite studies of individuals or families. The first approach to studying neighborhoods has been the use of national or multisite large studies of individuals or families. These studies typically include a large range of socioeconomic statuses (SES) and incomes across families and neighborhoods and permit estimation of neighborhood effects on the basis of a few individuals or families per neighborhood. Examples of such data sets are the Panel Study of Income Dynamics (PSID; Survey Research Center, 1984), the National Longitudinal Study of Youth—Child Supplement (NLSY-CS; Baker & Mott, 1989), and the Infant Health and Development Program (IHDP; Gross & Spiker, 1997;

Infant Health and Development Program, 1990). A majority of the neighborhood research conducted to date has been based on these types of data sets. Most of these data sets, however, were not designed specifically to examine neighborhood effects.

City or regional studies. The second approach, using data from city or regional studies, focuses on neighborhood effects within a city or metropolitan area. In some cases, a wide range of neighborhood types is included, and in others, the range is somewhat truncated (i.e., focusing on primarily poor and near poor urban neighborhoods). Examples of these more truncated neighborhood studies of cities are the Promotion of Academic Competence Study in Atlanta (Spencer, Cole, Jones, & Swanson, 1997), the Woodlawn Longitudinal Study (Ensminger, Lamkin, & Jacobson, 1996), the Pittsburgh Youth Study (Loeber & Wikstrom, 1993), and the Pathways to Adolescence Study in Baltimore, New York City, and Washington, DC (Spencer, Cole, et al., 1997). Examples of restricted neighborhood studies that are regional include a study in Los Angeles County by Aneshensel and Sucoff (1996) and the Beginning School Study in Baltimore (Entwisle, Alexander, & Olson, 1994). Many of these regional studies are based on school attendance rather than neighborhood residence (see, e.g., Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995) and community-based designs (see, e.g., Aneshensel & Sucoff, 1996). Thus, it is important to note that across these studies, sampling was not done with neighborhood influences in mind. Across these studies, the number of children per neighborhood varied widely as did the number of neighborhoods examined, making it difficult to implement hierarchical or multilevel modeling that takes into account the fact that neighborhood residence is not independent (or unique) across study participants. We discuss this issue further in our comparison of the different designs.

Neighborhood-based designs. Unlike the first two approaches, this strategy focuses on neighborhoods in the initial design. The sampling is conducted to ensure that certain types of neighborhoods are included, as well as a range of neighborhoods that are representative of some target population of neighborhoods. In addition, the sampling is designed to have a certain number of individuals per neighborhood unit to conduct hierarchical analyses. One example is the Project on Human Development in Chicago Neighborhoods (PHDCN; Sampson, Raudenbush, & Earls, 1997). In this study, cluster analysis was performed on Chicago census data to define neighborhood clusters (groups of two to three tracts that are internally homogeneous with respect to SES and racial/ethnic makeup). Census data were then used to define two stratification variables—SES (three levels) and racial/ethnic composition (seven levels). The three levels of SES were high, medium, and low, and the seven levels of ethnic/racial mix, which included three racially/ethnically homogeneous makeups and four racially/ethnically heterogeneous makeups, were (a) at least 75% African American, (b) at least 75% European American, (c) at least 75% Latino, (d) at least 20% Latino and at least 20% European American, (e) at least 20% Latino and at least 20% African American, (f) at least 20% African American and at least 20% European American, and (g) other heterogeneous makeups (Earls & Buka, 1997). The neighborhoods were cross-classified by these variables, and a stratified probability sample of 80 neighborhood clusters was drawn. However, there were no neighborhood clusters that met the criteria for three cells (low SES and at least 75% European American, high SES and at least 75% Latino, and high SES and at

least 20% Latino and at least 20% African American). For the longitudinal study, approximately 50 individuals per neighborhood cluster were interviewed (see Earls & Buka, 1997, for further details). Another recent example is a two-site study conducted by the MacArthur Foundation's Research Network on Successful Adolescent Development Among Youth in High Risk Settings in Philadelphia and Prince George's County in Maryland (Cook, Shagle, & Degirmencioglu, 1997; Furstenberg et al., 1999). In the Philadelphia Teen Survey, 65 census tracts were selected from four large sections of the city because they surrounded family planning clinics (the study was designed to evaluate them). The neighborhoods included some of the poorest European American neighborhoods and a range of African American neighborhoods. A multi-stage sampling procedure was used to obtain an adequate number of cases per tract. In Prince George's County, 137 tracts met criteria for inclusion in the study, and an average of 107 students and 10 adults was obtained per tract (additional school data were obtained for each tract).

Experimental designs. The final strategy entails randomly assigning families to reside in particular types of neighborhoods. Although this strategy may seem inauspicious, housing policies, such as housing mobility programs, afford researchers the opportunity to examine how a change in neighborhood context influences children and youth. Housing mobility programs generally involve relocating residents from one neighborhood, such as families living in public housing in poor neighborhoods, to housing in other neighborhoods, usually less poor neighborhoods. Moreover, these programs also have the benefit of experimental and quasi-experimental designs, because random assignment (or an approximation in the case of quasi-experimental designs) occurs when families are selected by the programs to move in that such programs cannot serve all eligible or interested families or, alternatively, the assignment of relocation is often quasi-random based on housing availability. These designs provide a better estimate of true neighborhood effects by minimizing selection as a problem. For example, the most well-known study of this type is the Gautreaux Project, which was the result of a court case in the mid-1970s over discriminatory practices in Chicago's public housing. Low-income African American families who resided in public housing (in poor, predominantly African American neighborhoods) volunteered for the program, which arranged for them to move to private housing with the assistance of Section 8 federal housing subsidies (or vouchers). Families moved throughout the Chicago area, both within the city to predominantly African American and predominantly European American neighborhoods and outside the city to the suburbs, which were predominantly European American, affluent neighborhoods. The Gautreaux Project entailed a quasi-experimental design because until 1990, city and suburban movers were selected in a quasi-random manner based on apartment availability rather than housing preference (Rosenbaum & Popkin, 1991). In response to some positive findings from the Gautreaux Project, the U.S. Department of Housing and Urban Development sponsored a randomized design in five of the nation's largest cities. This demonstration, entitled Moving to Opportunity (MTO), randomly assigned housing project residents—low-income, predominantly minority families with children—to one of three conditions: (a) an experimental or treatment group that received Section 8 housing vouchers and special assistance to move, with the requirement that the move be to a low-poverty

neighborhood defined as a neighborhood in which 10% or less of the residents were poor as measured by the 1990 Census (referred to as the experimental group because the members moved to affluent neighborhoods); (b) a control group that received Section 8 housing vouchers but no special assistance and no stipulation as to where to move (referred to as the Section 8 comparison group because the members moved but not necessarily to affluent neighborhoods); or (c) a second control group that did not receive vouchers or special assistance and thus remained in public housing (referred to as in-place controls because they did not move but stayed in place). A recent example of a quasi-experimental design is the Yonkers Project enacted following a federal court order to remedy long-standing racial segregation in public housing and schools in the city of Yonkers. As a result of the court mandate, the city of Yonkers built 200 units of low-rise public housing in mostly European American, middle-income neighborhoods of Yonkers. Subsequently, a group of very-low-income, mostly African American and Latino families who resided in public housing in low-income, predominantly minority neighborhoods in Yonkers was moved into the new housing between 1992 and 1994. A comparison group was composed of people who signed up for the program but were not selected. Programs such as these provide a context for examination of the potential mechanisms through which neighborhood effects are transmitted, such as parental behavior, peer groups, and schools.

Limitations and Advantages of the Four Research Designs

Clearly, each of these designs has its strengths and weaknesses, but studies that incorporate neighborhoods into the design phase or that use an experimental design improve researchers' ability to estimate neighborhood effects. With respect to national and regional designs, stronger and more consistent neighborhood effects have been documented in the national and multisite studies than in the regional and city-based studies. Evaluating the results of regional and city-based designs is particularly problematic if the number of neighborhood units is not specified. This situation is due in part to the higher interrelations among neighborhood dimensions found in local samples compared with national samples, because of the more restricted range in the type of neighborhoods sampled, usually at the lower end of the income distribution, and in the number of neighborhoods sampled, most often too many cases per neighborhood to provide unique estimates and too few cases per neighborhood to use multilevel data analytic techniques. For example, in *Neighborhood Poverty: Context and Consequences for Children* (Brooks-Gunn, Duncan, & Aber, 1997a), more consistent neighborhood effects were found in the national and multisite designs (PSID, NLSY-CS, IHDP) than in the local or regional designs (upstate New York, Atlanta, Adolescent Pathways) because of the difference in the range of neighborhoods sampled (i.e., a wide range in the national and multisite samples vs. a limited range in the local and regional samples), as well as the number of study participants residing in a neighborhood (i.e., very few cases per neighborhood in the national and multisite samples vs. a moderate number of cases per neighborhood in the local and regional samples). Duncan, Connell, and Klebanov (1997), using data from the PSID, compared estimates of neighborhood effects from ordinary least squares regression techniques with estimates from techniques designed to take into account the problem of

multicollinearity in neighborhood measures. Their results demonstrated that minimal clustering of study participants across neighborhoods led to an underestimation of neighborhood effects in a nationally based sample that had relatively few cases per neighborhood. In addition, their results highlighted that a more restricted range in the type of neighborhoods sampled can also lead to an underestimation of neighborhood effects, which is noteworthy as this was the case for the subsample of African American youth drawn from a nationally representative sample.

Duncan and Raudenbush (1999) have used an alternative approach to illustrate how clustering of neighborhoods leads to problems of multicollinearity among neighborhood census measures. Specifically, they used 1980 Census data to simulate the types of samples obtained from a national sample, city-based samples in a diverse and a nondiverse city, and "underclass" samples in a diverse and a nondiverse city, and found that neighborhood measures of race, female family-headship, welfare, poverty, education, residential stability, and male joblessness were more highly correlated in the city-specific samples than in the national sample and were, consequently, more problematic for examining neighborhood effects.

Neighborhood-based designs are preferable to national or regional studies because they permit multilevel modeling. Specifically, in the case of sufficient clustering (i.e., approximately 15 to 30 study participants per neighborhood), multilevel data analytic techniques, such as hierarchical linear modeling (HLM), are required to obtain reliable estimates of neighborhood effects (Bryk & Raudenbush, 1992; Duncan & Raudenbush, 1999; Sampson et al., 1997). These analytic techniques take into account the nested nature of neighborhood-based designs (i.e., that individuals are nested within neighborhoods). Accordingly, multilevel analyses, such as HLM, permit an examination of the variability of outcomes both within neighborhoods and across them and thus provide more reliable estimates of neighborhood effects on children and youth. In general, researchers using such an approach have found that neighborhoods are internally quite heterogeneous and that there tends to be more variability within neighborhoods than across neighborhoods (Cook et al., 1997; Elliott, et al., 1996).

Defining and Identifying Neighborhood Dimensions

When defining the neighborhood unit of analysis, several options are available. These include census information, local knowledge of boundaries in cities, health districts, police districts, and school districts. Administrative data sources rely on bureaucratically defined units that vary across systems (health, education, law enforcement, social services) but tend to overlap to some extent. Such definitions of neighborhoods have primarily been limited to city or regional studies and are often used in conjunction with census data. More ethnographic accounts of neighborhoods emphasize the fact that individuals perceive boundaries differently. Some studies rely on participants' ratings of neighborhoods, and neighborhood boundaries usually are not specified (see, e.g., Korbin & Coulton, 1997; Lauristen, 1994).

This review focuses on studies that primarily have used census tract data. Tract boundaries are delineated with the advice of local communities working under Census Bureau guidelines and typically reflect prominent physical features that define neighborhoods (e.g., major streets, railroads), as well as important social and

ethnic divisions (Duncan & Aber, 1997). Census tracts contain approximately 3,000 to 8,000 individuals. Data provided by the decennial census about neighborhood areas come from the census forms the population fills out on April 1 of the first year of every decade. Information on economic and demographic characteristics is provided by the census data and permits researchers to characterize neighborhoods according to a number of key dimensions, such as extent of neighborhood poverty, female family-headship, public assistance receipt, and male joblessness. To access census tract data, the addresses of study participants must be geocoded (coded for census tract), and then tract-level data can be appended to the data set. There is some evidence to suggest that residents' reports of neighborhood boundaries reflect the actual size of census tracts (Sampson, 1997).

Theoretical and analytical approaches have been used to define neighborhood dimensions. Theoretical approaches involve conceptually oriented analyses focusing on characteristics of neighborhoods thought to be of theoretical import. For example, Brooks-Gunn, Duncan, and colleagues (Brooks-Gunn, Duncan, Klebanov, & Sealander, 1993; Duncan, Brooks-Gunn, & Klebanov, 1994; Klebanov, Brooks-Gunn, & Duncan, 1994; Klebanov et al., 1998), using the theoretical models of Jencks and Mayer (1990), have sought to examine the relative influence of neighborhood affluence as compared with neighborhood low income on child, adolescent, and family well-being; different mechanisms were hypothesized to be at play depending on whether neighborhood affluence confers benefits or costs to residents (compared with middle-income neighborhoods) or whether neighborhood low income confers benefits or costs to residents (compared with middle-income neighborhoods). More analytically driven approaches distinguish neighborhood dimensions based on factor analyses (Brooks-Gunn, Duncan, & Aber, 1997a). For example, five neighborhood factors were identified from census data with the PSID sample—low SES, high SES, male joblessness, ethnic diversity, and family concentration (Brooks-Gunn, Duncan, & Aber, 1997a).¹ Other researchers have used this approach with more local data sets (Coulton, Korbin, & Su, 1996; Coulton, Korbin, Su, & Chow, 1995; Sampson et al., 1997).

Across all of the studies using census tract data, three dimensions have been examined most frequently: income or SES (affluence/high SES and poverty/low SES), racial/ethnic diversity, and residential instability. Although definitions of these three dimensions differ across studies, SES usually focuses on income or a combination of income, percentage of professionals in the neighborhood, percentage of residents with a high school or college degree, percentage of female headship of families, percentage of employed (or unemployed) individuals, and percentage of male joblessness (males age 16–64 who are not in the labor force, not in school, and not in the armed forces). Measures of racial/ethnic diversity are also fairly consistent across studies and are typically assessed by the percentage of African Americans, Latinos, and foreign-born residents in the neighborhood. Residential instability measures generally include the proportion of residents who have moved within the past 5 years, the proportion of households who have lived in their current home for less than 10 years, and the proportion of owner-occupied houses.²

An important distinction to make in defining and identifying neighborhood dimensions is between neighborhood structure and neighborhood social organization. The dimensions discussed thus

far have been defined by means of census data that assess structural aspects of neighborhoods, such as income, employment rates, household composition, and the like, but that do not directly evaluate the social organizational aspects of neighborhoods, such as informal social control and social cohesion. Pointing out this distinction is not to say that structural and social characteristics of neighborhoods are unrelated, as social disorganization theory is predicated on such links. For researchers to hypothesize about the processes and pathways through which neighborhoods might influence children and families, social organizational characteristics of neighborhoods are required. The census cannot be relied on for such information; rather, community surveys, systematic social observations, neighborhood expert surveys, or alternative administrative data (e.g., crime reports, vital health statistics) are required to reliably tap these dimensions of neighborhoods. Community surveys entail interviewing community residents (nonstudy participants) about their neighborhoods (Sampson et al., 1997). Systematic social observations, or windshield surveys, consist of trained observers using a structured format to characterize neighborhoods; data collected in this manner can be coded from in-person observations, videotaped observations, or audiotaped observations (Barnes-McGuire & Reiss, 1993; Raudenbush & Sampson, in press; Reiss, 1971; Spencer, McDermott, Burton, & Kochman, 1997; Taylor, Gottfredson, & Brower, 1984). Neighborhood expert surveys involve interviewing key community leaders, such as prominent religious, political, business, and social leaders in the community, about their neighborhoods (Earls & Buka, 1997). Community surveys, systematic social observations, and neighborhood expert surveys have primarily been used in studies with neighborhood-based designs, the neighborhood unit of analysis being defined in terms of census tracts (although respondents' definitions of neighborhoods have differed slightly). However, for systematic social observation, the unit of observation is not the census tract but the street- or face-block, which includes the two sides of the street facing a person's home.

¹ The factors identified were composed of the following census variables: *low SES* (percentage of nonelderly poor, percentage of single-parent families, percentage of female-headed households, percentage of African Americans, percentage of European Americans, ratio of children to families with children, percentage of families with children living as subfamilies, and ratio of two-parent families to children), *high SES* (percentage of managerial/professional workers, percentage of families with income greater than \$30,000, and percentage of individuals age 25 and older with 13 or more years of schooling), *male joblessness* (percentage of males age 16–64 not in labor force), *ethnic diversity* (percentage of Latinos, index of ethnic diversity, and percentage of residents not African American, European American, or Latino), and *family concentration* (percentage of residents age 5 and older who lived in same dwelling; Brooks-Gunn, Duncan, & Aber, 1997a).

² There is some indication that neighborhood structural dimensions identified by census data have shifted over time from the 1970 U.S. Census to the 1990 U.S. Census with increasing multicollinearity or grouping in the case of factor analyses of negative neighborhood dimensions, such as low SES and residential instability and even percentage of African Americans (see, e.g., Coulton, Pandey, & Chow, 1990; Jargowsky, 1997). This situation is not surprising given the increased concentration of poverty and racial and social isolation at the neighborhood level over the last few decades, as noted by Wilson (1987), Massey (1996), and others.

Because these approaches to assessing neighborhood social dimensions are relatively new, little is known about their reliability and validity. In a community survey, three criteria have been identified as important to the reliability of neighborhood measures obtained from a clustered (or neighborhood-based) design: (a) large variation among neighborhoods in the means or proportions of a measure, (b) minimal variance within neighborhoods on a measure, and (c) large sample sizes (O'Brien, 1990; see also Sampson, 1997). The reliability of neighborhood dimensions based on community surveys (i.e., aggregated reports of individuals within the same neighborhood) has been found to be quite high when a sufficient number of respondents per neighborhood are included (Sampson, 1997; Sampson et al., 1997; see also Perkins & Taylor, 1996). For example, Sampson (1997) examined the reliability of a report of child social control from a community survey undertaken as part of the PHDCN. This Chicago study included reports of over 3,500 respondents sampled from 80 neighborhood clusters in which approximately 50 respondents were interviewed per neighborhood. The measure of social control of children assessed the likelihood that residents would intervene if a group of children were skipping school and hanging out on a street corner, if children were spray painting graffiti on a local building, and if a child was showing disrespect to an adult; items were rated on a Likert-type scale. The reliability measure obtained from individual reports of social control was .79 (calculated with Cronbach's alpha, even though such a technique was inappropriate because of the clustered design), and the reliability estimate obtained with HLM from aggregated reports of social control from individuals within the same neighborhood was .81 (see Bryk & Raudenbush, 1992, for additional details on the HLM program).

Several studies using systematic social observation have found this method to be reliable and to have predictive validity (Perkins & Taylor, 1996; Raudenbush & Sampson, in press; Spencer, McDermott, et al., 1997). For instance, Raudenbush and Sampson (in press) used data from the PHDCN to identify the most reliable and salient (in terms of prediction) dimensions that can be ascertained from observational methods. Initial findings suggested that physical and social disorder (presence of graffiti, garbage, vacant housing, and abandoned cars, and presence of fighting, gang activity, public loitering, drinking, and drug use, respectively) may be key dimensions to measure with this approach. These measures were also highly correlated with census measures, such as low SES (see also Perkins & Taylor, 1996; Spencer, McDermott, et al., 1997). Neighborhood social dimensions are considered in this review's third section, *How Do Neighborhoods Influence Children and Youth?*

Inclusion of Family-Level Variables and Omitted Variable Biases

The majority of studies to be discussed include family-level as well as neighborhood-level variables. Typically, income, education, race/ethnicity, maternal age at birth, family structure, and sometimes family size are taken into account. Studies that do not include such controls cannot be used to estimate neighborhood effects because of the fact that family characteristics are associated with neighborhood characteristics (i.e., neighborhoods are defined by family/individual composition). For example, the low-birth-weight neighborhood literature is almost entirely based on health

districts and census tract data; no corresponding individual data are included (Collins & David, 1990; Coulton et al., 1995; O'Campo, Xue, Wang, & Caughy, 1997; Roberts, 1997). Thus, it is impossible to accurately estimate neighborhood effects in the occurrence of low birth weight because it is not known how much variation is attributable to individual versus neighborhood characteristics.

Even when models include family-level variables, misspecification of neighborhood effects is likely. This situation is referred to as selection bias or, in this instance, can also be called an *omitted variable bias*. Specifically, omitted variable biases result from the fact that unmeasured characteristics (individual, family, or neighborhood) associated with neighborhood residence might really account for any observed neighborhood effects (or at least for a portion of such effects). For example, unmeasured family characteristics could really account for neighborhood-level effects—that is, families who move into poor neighborhoods or families who do not leave poor neighborhoods may differ in a variety of ways from their peers who, even though equally poor or affluent, make different choices. Differences in motivation, emotional health, self-efficacy, literacy, and so on could actually account for any observed neighborhood effects (Duncan et al., 1997). Note these are not the family- or individual-level characteristics usually included in neighborhood analyses. As raised by many researchers, such as Jencks and Mayer (1990) and Tienda (1991), this oversight is likely to lead to an overestimation of neighborhood effects. Brooks-Gunn, Duncan, Leventhal, and Aber (1997), on the other hand, have argued that underspecification of neighborhood effects is equally likely because of the restricted range of neighborhoods examined in most studies (i.e., usually at the lower end of the range) and the weak theoretical link between the neighborhood demographic composition measures used in most studies and the theoretical processes thought to be important.

There are several ways to address the problem of omitted variable biases. Experiments using random assignment of families to residences in particular neighborhoods are perhaps the best approach (e.g., MTO and the Yonkers Project). Another approach is following families over time to model who moves and who does not. In addition, behavioral genetics studies that include individuals of varying genetic relatedness can be used to address this problem by accounting for genetic liability. Recently, Caspi, Taylor, Moffitt, and Plomin (in press) used such an approach with data from a national study in England of 2-year-old twins to explore the association between neighborhood deprivation (assessed by means of census) and children's behavior problems. By accounting for different levels of genetic relatedness among twins, the researchers were able to estimate the contribution of genetic and environmental factors. Environmental influences on behavior were further partialled into familywide (e.g., neighborhood) and child-specific components. Their findings revealed that neighborhood deprivation accounted for approximately 5% of the variance in the familywide environmental effect.

There are also several analytic techniques, such as sibling-based models and instrumental variables, for addressing problems of omitted variable bias. Sibling-based analyses are typically used with large national data sets that have adequate data on siblings or cousins (e.g., PSID and NLSY-CS). Such analyses take advantage of the variability in neighborhood conditions that arise from family migration over time by comparing the effects of neighborhood characteristics on siblings or first cousins. Omitted variable biases

are assumed to be accounted for because both measured and unmeasured family characteristics are held constant in these analyses. For example, Aaronson (1997) examined the association between neighborhood high school dropout rates and youths' chances of graduating high school in sibling-based models (fixed effects) and individual-based models (nonfixed effects or ordinary least squares regression effects). His results were strikingly similar across the two analytic techniques. An alternative approach is the use of instrumental variables in which a model is first estimated to remove the spurious correlation between neighborhood characteristics and child development through the use of an instrumental variable. Subsequently, the original neighborhood variable is replaced with a predicted estimate of the neighborhood variable that does not have the spurious correlation with unobserved or unmeasured characteristics, such as family income or maternal depression. The problem, however, is to find a variable (instrument) that is highly correlated with the neighborhood dimension under investigation but not highly correlated with the unobserved characteristics of children and families. As an exemplar, Foster and McLanahan (1996), who also examined the association between neighborhood high school dropout rates and youths' chances of graduating high school, used city labor-market conditions as an instrument to reduce the correlation between the neighborhood dropout rate and unmeasured family and child characteristics that might influence high school completion. The researchers, however, found that the use of the instrumental variable estimator did not substantially improve the estimate of neighborhood effects for girls compared with results obtained from ordinary least squares regression but did for boys.

Do Neighborhoods Matter for Children and Youth?

The domains of well-being that have been used to examine whether neighborhoods matter for children and youth include school readiness and achievement, behavioral and emotional problems (externalizing and internalizing), and sexuality and childbearing. Findings for each of the domains under investigation are presented by epoch—early childhood (0–6 years old), late childhood (7–10 years old), early adolescence (11–15 years old), and late adolescence (16–19 years old). Each general age group encompasses at least one major transition in a child's life, such as school entrance or exit, biological maturation, role shifts, and possibly cognitive alterations. The developmental challenges during these periods are relatively universal and require new modes of adaption to biological, psychological, or social changes (Graber & Brooks-Gunn, 1996). Within a domain, somewhat different indicators of child and adolescent well-being are associated with each epoch. For instance, school achievement in early and late childhood is assessed by means of verbal and cognitive ability, whereas, in late adolescence, educational attainment is the focus. Of importance is the fact that neighborhoods may influence each indicator differently or may operate differently across developmental epochs (Aber et al., 1997).

The selection process for studies included in this review entailed a search of relevant databases—psychology, sociology and demography, economics, and epidemiology—for articles published between 1990 and 1998. Furthermore, a majority of the studies reviewed resulted from the activity of a limited number of working

groups or research networks to which we had access, all of which have been mentioned previously.

Although this review is comprehensive, our analysis is framed by the three structural dimensions of neighborhoods most frequently examined—income/SES (affluence/high SES and poverty/low SES), racial/ethnic diversity, and residential instability. In selecting these dimensions, we limited the review in this section to studies that relied on census-based measures of neighborhoods, as aggregating measures of family-level indicators to obtain neighborhood dimensions is both uncommon and unreliable (given that most studies do not have an adequate number of families per neighborhood to create unbiased measures). In the following section, we consider social organizational dimensions of neighborhoods (not based on census tract level data) that might matter for children and youth. In both sections, we consider only studies in which familial- and individual-level factors (e.g., family income, family structure, maternal education, maternal age, and race/ethnicity) are accounted for in the analyses.

Across the studies reviewed, neighborhood effects are demonstrated in the childhood as well as the adolescent years. Most studies, however, have focused either on early childhood or on late adolescence. Two main findings are evident in the following review. First, neighborhood effects are more common for neighborhood SES than racial/ethnic heterogeneity or residential stability across all of the outcomes, and second, more consistent neighborhood effects are reported in the national samples as compared with the city- and region-based studies. In most instances, the neighborhood effects reported are small to modest and account for 5% to upwards of 10% of the variance in child and adolescent outcomes.³ Although not reviewed here, family-level variables tend to be more strongly associated with individual outcomes than are neighborhood-level variables.

School Readiness and Achievement

During early childhood and adolescence, the most consistent finding was that high-SES neighbors had a positive effect on school readiness and achievement outcomes (after accounting for individual and family characteristics), especially for European Americans. A majority of these studies have been conducted on children and youth drawn from multisite and national-based samples. Table 1 presents a summary of the studies that have examined neighborhood effects on children's and adolescents' school readiness and achievement.

In a series of studies, Brooks-Gunn and colleagues (Brooks-Gunn et al., 1993; Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov, 1997; Duncan et al., 1994; Klebanov, Brooks-Gunn, Chase-Lansdale, & Gordon, 1997; Klebanov et al., 1994, 1998)

³ An effect is considered large if a change in status (e.g., living in a low-income neighborhood compared with living in a middle-income neighborhood) amounts to at least one third of a standard deviation (a standard deviation for IQ and achievement tests is about 15 points, so 5 points or larger) and the coefficient is significant at the .05 level or below. In contrast, an effect is considered small to moderate if the effect size is not consistently large (i.e., less than one third of a standard deviation) and the coefficient is significant at the .05 level. No effect is characterized by few if any significant coefficients across models (Duncan & Brooks-Gunn, 1997).

Table 1

Summary of Studies Used to Examine Neighborhood Effects on Children's and Adolescents' School Readiness and Achievement

Study	Design	Sample	Neighborhood data	Findings from published studies
Children				
Children of National Longitudinal Survey of Youth	Children born to women in nationally representative study	673 children aged 3-4 & 5-6 (approx. 40% African American)	1980 Census tract data; 70% only study child in tract	<i>Chase-Lansdale & Gordon (1996)</i> : SES positive association with 5-6-year-olds' PPVT-R & reading achievement; racial similarity positive association with 5-6-year-olds' PPVT-R. <i>Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov (1997)</i> : High SES positive association with 5-6-year-olds' PPVT-R (boys only) & reading achievement (European Americans only); low SES negative association with girls' math achievement; male joblessness negative association with boys' reading achievement & positive association with girls' reading & math achievement; ethnic diversity negative association with European Americans' PPVT-R.
Infant Health & Development Program	Early intervention for low birth weight, premature infants at 8 sites across country	Approx. 1,000 children from diverse SES & racial/ethnic backgrounds	1980 Census tract data; average 1.1 cases per tract	<i>Brooks-Gunn, Duncan, Klebanov, & Sealand (1993)</i> : Affluence positive association with 3-year-olds' IQ. <i>Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov (1997)</i> : High SES positive association with 3-year-old European Americans' IQ (boys only) and boys' PPVT-R & 5-year-olds' PPVT-R (boys only) & verbal IQ; ethnic diversity negative association with 5-year-old European Americans' verbal IQ & PPVT-R. <i>Duncan, Brooks-Gunn, & Klebanov (1994)</i> : Affluence positive association with 5-year-olds' IQ. <i>Klebanov, Brooks-Gunn, McCarton, & McCormick (1998)</i> : Affluence & low income no association with 1- & 2-year-olds' IQ.
Adolescents				
Adolescent Pathways Project	Longitudinal study of students from low-income schools in New York City, Baltimore, & Washington, DC	669 10-16-year-olds (54% African American)	1980 Census tract data	<i>Halpern-Felsher et al. (1997)</i> : Low SES negative association with European American females' combined reading/math scores.
Beginning School Study in Baltimore	Longitudinal study of youth from 20 randomly selected schools	Approx. 450 8th graders (approx. 50% African American)	1980 Census data; 26 regional planning districts	<i>Entwisle, Alexander, & Olson (1994)</i> : Income positive association with boys' math achievement.
California Study	Students drawn from 5 San Francisco Bay Area schools	Approx. 7,000 predominantly European American high school students	1980 Census tract data	<i>Dornbusch, Ritter, & Steinberg (1991)</i> : SES positive association with reported grades.
Gautreaux Study	Quasi-experimental design	342 African American & Latino families from public housing	Not available	<i>Rosenbaum, Kulieke, & Rubinowitz (1988)</i> : Youth who moved to more affluent suburbs more likely to graduate high school, take college prep classes, & go to college than youth who remained in city.
Panel Study of Income Dynamics	Nationally representative, longitudinal study	Approx. 3,500 14-22-year-olds (approx. 50% African American)	1970 & 1980 Census tract data	<i>Aaronson (1997)</i> : Dropout rate negative association with HSG. <i>Brooks-Gunn, Duncan, Klebanov, & Sealand (1993)</i> : Affluence positive association with European Americans' HSG; female headship negative association with HSG. <i>Duncan (1994)</i> : Affluence positive association with European Americans' & advantaged African American females' completed schooling & European American males' college attendance; low income positive association with European American males' & African American females' completed schooling & European American males' college attendance; female headship negative association with African American females' & European American males' completed schooling & African Americans' HSG; female employment rate negative association with females' completed schooling (advantaged African Americans only) & college attendance & positive association with European American males' completed schooling & HSG; percent African American negative association with African Americans' completed schooling (advantaged males only) & college attendance. <i>Foster & McLanahan (1996)</i> : Dropout rate negative association with females' HSG. <i>Halpern-Felsher et al. (1997)</i> : High SES positive association with completed schooling (excluding African American males); ethnic diversity positive association with African American males' completed schooling.

Table 1 (continued)

Study	Design	Sample	Neighborhood data	Findings from published studies
Promoting Academic Competence	Longitudinal school-based study in Atlanta	346 11–16-year-old African Americans	1980 Census tract data	<i>Halpern-Felsher et al. (1997)</i> : High SES positive association with African American females' Iowa Basic Skills scores; male joblessness negative association with African American males' basic skills.
Public Use Microdata Sample	Nationally representative study	92,512 16–19-year-olds	1970 15% Neighborhood Characteristics file	<i>Crane (1991)</i> : Managerial/professionals positive nonlinear association with HSG; when drop to very few, association stronger for African American males.
Scottish Young People's Survey	Study of 1 educational authority	2,500 young adults	1981 Scottish Census enumeration district data	<i>Garner & Raudenbush (1991)</i> : Social deprivation negative association with educational attainment.
Upstate New York sample	Students drawn from urban school district	1,040 8–11-year-olds, 3,406 12–15-year-olds, & 1,797 15–20-year-olds (approx. 75% African American)	1980 Census tract data	<i>Connell & Halpern-Felsher (1997)</i> : Neighborhood risk negative association with African American males' HSG. <i>Halpern-Felsher et al. (1997)</i> : High SES negative association with 12–20-year-old European American males' educational risk; male joblessness positive association with 8–15-year-old African American males' & European American females' (12–15-year-olds only) educational risk.
Woodlawn Study	Longitudinal study of disadvantaged youth in Chicago	954 African Americans	Average 1970 & 1980 Census tract data; 202 tracts	<i>Ensminger, Lamkin, & Jacobson (1996)</i> : Managerial/professionals positive association with males' completed schooling & HSG.

Note. All findings reported are for analyses in which individual and family characteristics were taken into account. Definitions of neighborhood measures are available upon request. SES = socioeconomic status; PPVT-R = Peabody Picture Vocabulary Test—Revised; HSG = high school graduation.

have documented the powerful and beneficial effects of neighborhood affluence (the proportion of residents in the tract with income over \$30,000) or high SES (a composite variable derived from factor analysis that includes percentage of managerial/professional workers, percentage of residents with incomes over \$30,000, and percentage of college-educated residents) on young and early school-age children's IQ, verbal ability, and reading recognition scores. Specifically, in the IHDP (a multisite intervention program for low-birth-weight premature infants), although no neighborhood effects were found at ages 1 and 2 (Klebanov et al., 1998), results when the children in the program were age 3 indicated that residing in an affluent (compared with a middle-income neighborhood defined by the proportion of residents with incomes between \$10,000 and \$30,000) or a high-SES neighborhood was positively associated with children's IQ scores (Brooks-Gunn et al., 1993; Chase-Lansdale et al., 1997). Examination of race as a potential moderator of neighborhood effects revealed that for young children, the benefit of affluent neighbors (as opposed to middle-income neighbors) on children's IQ scores at age 3 may be more salient for European American children than for African American children (Brooks-Gunn et al., 1993). Similar findings were reported among children ages 5 to 6 with respect to the beneficial effects of neighborhood high SES for children's IQ, verbal ability, and reading achievement scores (Chase-Lansdale & Gordon, 1996; Chase-Lansdale et al., 1997; and Duncan et al., 1994).

The few studies that examined the association between neighborhood SES and young adolescents' achievement are based on city and regional samples (Dornbusch, Ritter, & Steinberg, 1991; Entwisle et al., 1994; Halpern-Felsher et al., 1997). Overall, these studies reported that neighborhood SES is positively associated with various indicators of adolescents' achievement (math

achievement, basic skills tests, and grade point average) and negatively associated with educational risk. Two of the three studies found that neighborhood SES may have more pronounced effects for young adolescent males' achievement than for their female peers (Entwisle et al., 1994; Halpern-Felsher et al., 1997).

Among older adolescents, several studies have found links between neighborhood high SES and educational attainment. Three studies based on the PSID have found that neighborhood affluence (compared with middle-income neighborhoods) or neighborhood high SES was positively associated with youths' chances of completing high school, attending college, and years of schooling completed (Brooks-Gunn et al., 1993; Duncan, 1994; Halpern-Felsher et al., 1997). Across these studies, the benefit of affluent neighbors for older adolescents' educational attainment appears to hold more for European Americans than for African Americans. However, in a city-based study of predominantly African American youth, Ensminger et al. (1996) found that the presence of middle-class neighbors was positively associated with male youths' chances of graduating high school and with years of schooling completed. Further, in the Gautreaux Project, where low-income, minority families residing in public housing in Chicago moved throughout the Chicago area, youth who moved to the more affluent suburbs were more likely to stay in school, to be in college preparatory classes, and to go on to college than their peers who remained in the city (Rosenbaum, Kulieke, & Rubinowitz, 1988). Finally, the findings from several studies (national and regional) indicate that the positive association between neighborhood high SES and educational attainment may be stronger for male youth than female youth (Connell & Halpern-Felsher, 1997; Duncan, 1994; Ensminger et al., 1996; Halpern-Felsher et al., 1997).

Several studies have found other indicators of neighborhood SES, such as the high school dropout rate, levels of female family-headship and female employment, and the number of managerial and professional workers, to be associated with educational attainment. All of these studies have been based on national data sets, most notably the PSID (Aaronson, 1997; Brooks-Gunn et al., 1993; Duncan, 1994; Ensminger et al., 1996; Foster & McLanahan, 1996; Garner & Raudenbush, 1991). Neighborhood effects were reported even when researchers used estimation techniques to address the problem of omitted variable bias (i.e., sibling analyses and instrumental variables; Aaronson, 1997; Foster & McLanahan, 1996) and multilevel modeling (Garner & Raudenbush, 1991).

Finally, a well-known study by Crane (1991) using data from the Public Use Microdata Sample (PUMS) found that when the percentage of professional or managerial workers in neighborhoods fell to a particularly low level, defined as 5% or less (or reached a "tipping point"), neighborhoods had more pronounced effects on youths' chances of dropping out of high school. Further, African American males were most adversely affected by living with low-income neighbors. Clark (1992), however, failed to replicate this nonlinear effect (but see also Brooks-Gunn et al., 1993).

Racial/ethnic diversity has been found to be negatively associated with children's school readiness. Family residence in an ethnically diverse neighborhood (presence of Latinos and foreign-born residents) was negatively associated with young children's verbal ability in both the IHDP and the NLSY-CS; effects were stronger for European Americans than for African Americans (Chase-Lansdale & Gordon, 1996; Chase-Lansdale et al., 1997).

Among older adolescents, two studies based on the PSID but using slightly different indicators found evidence that racial/ethnic diversity was associated with African American male youths' school achievement (Duncan, 1994; Halpern-Felsher et al., 1997). It appears that residing in ethnically diverse neighborhoods (presence of Latinos and foreign-born individuals) and neighborhoods with few African Americans is positively associated with African American young men's years of schooling completed and college attendance. These effects, however, could be due to youth attending more racially and ethnically diverse high schools (Crain & Wells, 1994).

Behavioral and Emotional Problems

The findings for behavior problems are less consistent than those reported for cognitive and school outcomes. The strongest evidence is provided for the adverse effect of low-SES neighbors on children's and adolescents' mental health (after taking into account family-level characteristics), possibly more so for externalizing (acting out and aggressive) behaviors than internalizing (depressive and withdrawn) behaviors. Table 2 presents a summary of the studies that have examined neighborhood effects on children's and adolescents' behavioral and emotional outcomes.

A majority of the studies of neighborhood effects on young childhood's mental health are based on maternal-reported behavior problems. Using this indicator of emotional well-being, several studies reported neighborhood effects for low SES during early childhood. Among young children, maternal-reported behavior problems (externalizing and internalizing) have been examined in two nationally based studies—the IHDP and the NLSY-CS (Brooks-Gunn et al., 1993; Chase-Lansdale & Gordon, 1996;

Chase-Lansdale et al., 1997; Duncan et al., 1994). Specifically, among 3-year-old children in the IHDP, few managerial and professional workers in the neighborhood was associated with higher amounts of reported behavior problems (externalizing and internalizing; Brooks-Gunn et al., 1993). Among children ages 5 to 6, the presence of low-income neighbors (as compared with middle-income neighbors) or low-SES neighbors was associated with increased amounts of reported externalizing behavior problems (Chase-Lansdale et al., 1997; Duncan et al., 1994). On the contrary, across two studies using data from the NLSY-CS, residing in a neighborhood with more socioeconomic resources was positively associated with increased amounts of reported internalizing problems among young children (Chase-Lansdale & Gordon, 1996; Chase-Lansdale et al., 1997).

Among older children, Kupersmidt et al. (1995) examined peer-reported aggression and peer rejection in a sample of second through fifth graders residing in a southern school district. Their findings suggested that African American children in middle-SES neighborhoods displayed less peer-reported aggression than did their peers in low-SES neighborhoods (all children were from low-SES and single-parent homes, so familial characteristics were in effect held constant). In this same study, for low-SES, European American children from single-parent families, living in a middle-SES neighborhood was associated with greater peer rejection compared with their peers in low-SES neighborhoods.

For adolescents, neighborhood SES effects on behavioral and emotional problems have primarily been examined in regional and city-based studies. For example, among 13- and 16-year-old males in the Pittsburgh Youth Study, residing in low-SES or underclass (i.e., poverty, unemployment, male joblessness, female family-headship, nonmarital childbearing, African American presence, and welfare receipt) neighborhoods was positively associated with delinquent and criminal behavior, including the severity and frequency of delinquency (Loeber & Wikstrom, 1993; Peeples & Loeber, 1994). The effect of neighborhood residence on younger adolescents' problem behavior was stronger than that found among the older adolescents (Loeber & Wikstrom, 1993). Additional research on adolescents from national and regional studies suggests that residing in a low-SES neighborhood is associated with higher rates of criminal and delinquent behavior, as well as internalizing behaviors (Sampson & Groves, 1989; Simons, Johnson, Beaman, Conger, & Whitbeck, 1996).

Evidence from two experimental studies indicates that neighborhood low SES is associated with adolescents' externalizing behavior problems. First, an evaluation of the Yonkers Project found that adolescents who remained in low-income neighborhoods were more likely to show signs of problem drinking in the previous month and to have used marijuana in the past year than were youth who moved to middle-income neighborhoods (Briggs, 1997b). Ludwig, Duncan, and Hirschfield (1998) used experimental data from the Baltimore sample of MTO to examine the frequency of criminal activity among predominantly African American adolescents aged 13–17. Reports of criminal activity were based on juvenile criminal-offender records from the Maryland Department of Justice. Their findings indicated that for boys, youth who moved to low-poverty neighborhoods were less likely to be arrested for violent crimes (assaults, robbery, rape, and other sex crimes) than were their peers who

Table 2

Summary of Studies Used to Examine Neighborhood Effects on Children's and Adolescents' Behavioral and Emotional Outcomes

Study	Design	Sample	Neighborhood data	Findings from published studies
Children				
Children of National Longitudinal Survey of Youth	Children born to women in nationally representative study	673 children aged 3–4 & 5–6 (approx. 40% African American)	1980 Census tract data; 70% only study child in tract	<i>Chase-Lansdale & Gordon (1996)</i> : SES positive association with 5–6-year-olds' internalizing behavior problems; male joblessness positive association with 5–6-year-olds' internalizing & externalizing (African Americans only) problems. <i>Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov (1997)</i> : High SES positive association with girls' internalizing (aged 5–6 only) & externalizing behavior problems; low SES negative association with 5–6-year-old boys' internalizing behavior problems; ethnic diversity negative association with 3–4-year-old African Americans' internalizing behavior problems & positive association with 5–6-year-old boys' internalizing behavior problems; male joblessness positive association with 3–4-year-old European Americans' internalizing behavior problems & 5–6-year-old African Americans' internalizing (boys only) & externalizing behavior problems.
Drug Abuse Resistance Education Program	Students drawn from 36 schools in diverse SES Midwestern school district	747 predominantly European American 5th & 6th graders	1990 Census block group data	<i>Ennett, Flewelling, Lindrooth, & Norton (1997)</i> : Residential instability negative association with school rates of lifetime alcohol use.
Infant Health & Development Program	Early intervention for low birth weight, premature infants at 8 sites across the country	Approx. 1,000 children from diverse SES & racial/ethnic backgrounds	1980 Census tract data; average 1.1 cases per tract	<i>Brooks-Gunn, Duncan, Klebanov, & Sealand (1993)</i> : Managerial/professionals negative association with 3-year-olds' behavior problems. <i>Chase-Lansdale, Gordon, Brooks-Gunn, & Klebanov (1997)</i> : Male joblessness negative association with 3-year-old African Americans' & girls' internalizing & externalizing behavior problems. <i>Duncan, Brooks-Gunn, & Klebanov (1994)</i> : Low income negative association with 5-year-olds' externalizing behavior problems.
Adolescents				
British Crime Survey	National study	Approx. 22,000 youth aged 16+ from 2 cohorts	1984 British Population Censuses & Surveys; 60 cases per neighborhood	<i>Sampson & Groves (1989)</i> : SES negative association with crime & delinquency; ethnic heterogeneity positive association with crime & delinquency; residential stability negative association with crime & delinquency; urbanization positive association with crime.
Iowa Single Parent Project	Panel study of families in small towns & cities	207 European American 8th & 9th graders	Census data; 104 communities	<i>Simons, Johnson, Beaman, Conger, & Whitbeck (1996)</i> : Community disadvantage positive association with males' psychological distress; percentage single-parent families positive association with females' conduct problems.
Los Angeles County Study	Community-based survey	877 racially/ethnically diverse 12–17-year-olds	1990 Census tract data; 49 tracts	<i>Aneshensel & Sucoff (1996)</i> : Conduct disorders high in low-SES, African American neighborhoods & low in low-SES, Latino neighborhoods; oppositional defiant disorders low in low/middle-SES, African American neighborhoods & high in middle-SES, European American & Latino neighborhoods; depression high among Latinos except in low-SES, Latino neighborhoods.
Moving to Opportunity (Baltimore site evaluation)	Randomized design in 5 cities	358 predominantly African American & Latino 13–17-year-olds	1990 Census data	<i>Ludwig, Duncan, & Hirschfield (1998)</i> : Male youth who moved to low-poverty neighborhoods less likely be arrested for violent crimes than youth who stayed in public housing in poor neighborhoods or moved from public housing to low/middle-income neighborhoods; male youth who moved to low/middle-income neighborhoods less likely to be arrested for nonviolent crimes than youth who remained in public housing in poor neighborhoods.
Pittsburgh Youth Study	Longitudinal study of antisocial behavior with boys drawn from 7 schools	508 13- & 506 16-year-old males (approx. 50% African American)	1980 Census tract data; 88 neighborhoods per Pittsburgh classification (1–7 tracts)	<i>Loeber & Wikstrom (1993)</i> : SES negative association with delinquency & offending trajectories, especially for 13-year-olds living in inner city. <i>Peebles & Loeber (1994)</i> : Underclass positive association with severity & frequency of delinquency.
Study of Peers	Students drawn from 6 schools in small southern city	1,271 2nd–5th graders (40% African American; 35% low income)	1980 Census block data; 29 neighborhoods	<i>Kupersmidt, Griesler, DeRosier, Patterson, & Davis (1995)</i> : Low SES positive association with aggression for African American, low-income children from single-parent families & with peer rejection for European American, low-income children from single-parent families; middle SES negative association with aggression for African American, low-income children from single-parent families.
Yonkers Project	Quasi-experimental design	317 African American & Latino families from public housing	1990 Census data	<i>Briggs (1997a, 1997b)</i> : Youth who remained in low-income neighborhoods more likely to show signs of problem drinking in previous month & to have used marijuana in past year than youth who moved to middle-income neighborhoods.

Note. All findings reported are for analyses in which individual and family characteristics were taken into account. Definitions of neighborhood measures are available upon request. SES = socioeconomic status.

stayed in public housing in poor neighborhoods or their peers who moved out of public housing, but moved to predominantly low-to-middle-income neighborhoods. Among youth who moved to low-to-middle-income neighborhoods, crime rates for nonviolent and nonproperty crimes, such as drug offenses, truancy, runaway, disorderliness, and weapon offenses, were significantly lower than the rates for youth who remained in public housing in poor neighborhoods. These results were found even after using an instrumental variable approach to address problems of selection bias. No significant group differences were found for girls (rates of criminal behavior were lower for girls than for boys).

During childhood, the findings for racial/ethnic diversity are limited to young children's behavior problems. Specifically, among children age 3–4 in the NLSY-CS, greater ethnic diversity in the neighborhood was associated with fewer reported internalizing behavior problems for African American children but not for their European American peers (Chase-Lansdale et al., 1997). Ethnic diversity, on the contrary, had an adverse effect on 5–6-year-old boys' internalizing behavior problems in the same sample.

Few studies have examined the role of racial/ethnic diversity and adolescents' behavioral and emotional problems. Among two cohorts of British youth, Sampson and Groves (1989) found that residing in neighborhoods with greater ethnic heterogeneity was positively associated with adolescents engaging in criminal activity (personal and property victimization), especially personal victimization. Among predominantly older adolescents, Aneshensel and Sucoff (1996) investigated the effect of neighborhood SES and racial/ethnic diversity simultaneously on mental health. Using data from a community-based sample of 12–17-year-olds in Los Angeles, these researchers identified neighborhood types by cluster analysis of census data on SES and ethnic/racial composition. The prevalence of oppositional defiant disorder was found to be highest among youth in middle-SES communities with high concentrations of European Americans and Latinos and lowest among youth in low-SES, African American neighborhoods. The incidence of conduct disorders, on the contrary, was highest among youth residing in low-SES, African American neighborhoods and lowest among youth in low-SES, Latino neighborhoods. Latino youth generally experienced higher levels of depressive symptomatology than did their European American and African American peers, except when they resided in low-SES neighborhoods with high concentrations of Latinos.

Neighborhood residential instability has been linked to substance use in older children. A study using a school-based sample of predominantly European American fifth- and sixth-grade children residing in the Midwest found that schools located in neighborhoods with low residential instability were more likely to have higher rates of lifetime alcohol use than schools in more disadvantaged neighborhoods (Ennett, Flewelling, Lindrooth, & Norton, 1997). Among adolescents, residential instability has primarily been examined by researchers working within the community social disorganization framework. Sampson and Groves (1989) found some evidence that high rates of residential instability were associated with adolescent juvenile delinquency and crime, particularly property crimes.

Sexuality and Childbearing

Although the findings for neighborhood effects on adolescent sexuality and childbearing are somewhat varied, perhaps the most consistent pattern of results is the association between neighborhood SES, as assessed by employment indicators, and adolescents' coital and fertility outcomes (controlling for individual and family characteristics). All studies of this topic have been conducted on large national samples. Table 3 presents a summary of the studies that have examined neighborhood effects on adolescents' sexuality and fertility outcomes.

Several studies have found various indicators of neighborhood SES to be associated with adolescent sexual activity. Two studies based on national data sets (PUMS and PSID) have found that the socioeconomic conditions of neighborhoods, as measured by the presence of few professional or managerial workers in the neighborhood, were associated with an increased risk of adolescent and nonmarital childbearing (Brooks-Gunn et al., 1993; Crane, 1991). Neighborhood effects may be more pronounced for African American females and females in the inner city (Crane, 1991). The presence of neighborhood economic and social resources, on the other hand, is associated with decreased nonmarital childbearing among women (Billy & Moore, 1992; Brooks-Gunn et al., 1993). Among a national sample of adolescent males (National Survey of Adolescent Males; NSAM), rates of neighborhood poverty were positively associated with frequency of intercourse and having impregnated someone and negatively associated with effective contraceptive use (Ku, Sonenstein, & Pleck, 1993).

Other measures of neighborhood SES, in particular (un)employment measures, are associated with teenage sexuality and childbearing. Specifically, for male adolescents age 15–19 in the NSAM, a high number of unemployed residents in the neighborhood was positively associated with fertility outcomes (impregnating someone and fathering a child; Ku et al., 1993). Similarly, for females in the National Survey of Family Growth (NSFG-III), a high number of unemployed female workers in the neighborhood was associated with increased nonmarital childbearing (Billy & Moore, 1992). Among female adolescents, several studies using data from the NSFG-III have found a positive association between rates of female participation in the labor force and sexuality outcomes, including timing of first intercourse, risk of premarital sexual activity, and noncontracepted first intercourse (Billy, Brewster, & Grady, 1994; Brewster, 1994a, 1994b; see also Billy & Moore, 1992). These findings with respect to female employment rates probably have less to do with socioeconomic resources and more to do with the monitoring and supervision of youth.

Only two studies report neighborhood effects for racial/ethnic diversity (Billy et al., 1994; Ku et al., 1993). Among both male and female adolescents, a high proportion of foreign-born residents in the neighborhood was negatively associated with sexual activity (premarital sex, number of sexual partners, and effective contraceptive use).

How Do Neighborhoods Influence Children and Youth?

More theoretical work on the mechanisms through which neighborhoods might influence behavior has been conducted than empirical research. One approach has been to examine neighborhood structural dimensions to see whether each has a positive or nega-

Table 3
Summary of Studies Used to Examine Neighborhood Effects on Adolescents' Sexuality and Childbearing

Study	Design	Sample	Neighborhood data	Findings from published studies
National Survey of Family Growth	Nationally representative study of reproductive behavior	7,969 14–44-year-old females	1980 Census tract data, 1983 County & City Data Book	<i>Billy, Brewster, & Grady (1994)</i> : Racial/ethnic composition negative association with 15–19-year-old European Americans engaging in premarital sex; female labor force participation positive association with 15–19-year-olds engaging in premarital sex; adolescent joblessness positive association with 15–19-year-old African Americans' frequency of intercourse. <i>Billy & Moore (1992)</i> : SES negative association with nonmarital childbearing; female unemployment positive association with nonmarital childbearing. <i>Brewster (1994a)</i> : Female labor force participation positive association with 14–20-year-old African Americans' noncontracepted first intercourse (urban areas only). <i>Brewster (1994b)</i> : Female labor force participation positive association with 15–19-year-olds' timing of first intercourse.
National Survey of Adolescent Males	National survey of never-married males	1,880 15–19-year-olds	1980 Census tract & zip-code data; 1,494 tracts	<i>Ku, Sonenstein, & Pleck (1993)</i> : Poverty positive association with frequency of intercourse & effective contraceptive use & negative association with impregnating someone; unemployment rate positive association with impregnating someone & fathering live birth; percent Latino negative association with number of partners & effective contraceptive use.
Panel Study of Income Dynamics	Nationally representative, longitudinal study	Approx. 3,500 14–22-year-olds (approx. 50% African American)	1970 & 1980 Census tract data	<i>Brooks-Gunn, Duncan, Klebanov, & Sealand (1993)</i> : Affluence negative association with European Americans' nonmarital childbearing; managerial/professionals negative association with nonmarital childbearing.
Public Use Microdata Sample	Nationally representative study	92,512 16–19-year-olds	1970 15% Neighborhood Characteristics file	<i>Crane (1991)</i> : Managerial/professionals negative nonlinear association with teenage childbearing; when drop to very few, association stronger for African Americans & females in cities.

Note. All findings reported are for analyses in which individual and family characteristics were taken into account. Definitions of neighborhood measures are available upon request. SES = socioeconomic status.

tive effect on child development to distinguish which of the models identified by Jencks and Mayer (1990) may be at play and consequently, to suggest how neighborhood effects may be operating. As described in the introduction, the five general models the researchers outlined include neighborhood institutional resources, collective socialization, contagion (or epidemic), competition, and relative deprivation. According to the first three models (resource, collective socialization, and contagion), high-SES neighbors confer benefits to children and youth, whereas the last two models (competition and relative deprivation) predict that more advantaged neighborhoods negatively affect children and youth. However, these models do not explicitly identify how neighborhoods may affect children and youth in terms of specific mediators or mechanisms; rather, they permit researchers to hypothesize which of several mechanisms may be operating with limited specification of actual processes.

An alternative approach (although possibly related to the contagion model) has been to examine threshold or nonlinear effects of neighborhoods on children's and youths' development. Such effects have been examined with respect to negative neighborhood attributes, such as links between few managerial and professional employees in the neighborhood and high school completion (Crane, 1991). Though a less common strategy, this approach has held widespread appeal among researchers. Again, the mechanisms through which such effects are transmitted are not clearly

differentiated from other theoretical models proposed by Jencks and Mayer (1990), except that such effects are likely to be adverse rather than beneficial.

Sociologists and urban scholars working within the community social disorganization framework have used yet another approach to examine how neighborhoods might affect children and youth (Coulton et al., 1995; Elliott et al., 1996; Sampson & Groves, 1989). In general, these researchers have examined the cluster of behaviors and neighborhood characteristics thought to be associated with neighborhood social organization and their impact on children's and adolescents' development (Coulton et al., 1995; Elliott et al., 1996; Sampson, 1997; Sampson & Groves, 1989). Some of these researchers, however, have examined more explicitly the mechanisms through which such organization is promoted or thwarted, whereas others have not.

More ecologically driven scholars have considered other levels of influence on children's and youths' development besides neighborhoods, such as parents, families, peers, and schools. Some of this work postulates that variables at these different levels or units of analysis act as moderators of neighborhood influences. For example, neighborhood effects may vary depending on peer characteristics or parenting behavior. Other research suggests that these different levels of influence could be conceived of as mediators. For instance, parental behavior may be the primary mechanism through which neighborhood influences operate on child outcomes

(i.e., mediated or indirect effects); whereas, for adolescents, neighborhood effects may be more direct rather than mediated by parents, and indirect neighborhood effects may be transmitted through other processes, such as peer activities.

Both the sociological and ecological approaches to studying neighborhoods have as an implicit premise that neighborhood influences are likely to be indirect, that is, that they operate through more proximal behaviors. This belief is especially prevalent when looking at how neighborhoods might influence children. For example, neighborhood resources, typically characterized by structural dimensions such as income, may directly affect young children but also may indirectly affect young children by way of parental behavior and family functioning. Resource models are especially relevant to children because, throughout the childhood years, parents or parental figures manage and supervise children's lives and may play a more salient role in children's development than do peers and neighbors (Furstenberg, 1993; Jarrett, 1997; Korbin & Coulton, 1997). Parents must act as advocates or brokers for their children's receipt of community resources. Thus, the effect of neighborhood resources on young children's outcomes is likely to be more indirect (i.e., to operate through familial processes) than direct. Even throughout the school years, when hypothesized indirect effects of neighborhoods are thought to operate through peers and schools (e.g., community organization, contagion, competition, and relative deprivation models), parents still supervise much of older children's and adolescents' time.

Our goal in this section is to use the different approaches discussed thus far to reformulate strategies for examining the pathways through which neighborhood effects are transmitted to children and adolescents. To assess these mechanisms, it is necessary for researchers to go beyond census data to examine individual-, family-, and neighborhood-level processes. The following is a brief overview of the potential mechanisms through which neighborhoods may influence children and youth.

(1) *Institutional resources*: The availability, accessibility, affordability, and quality of learning, social, and recreational activities, child care, schools, medical facilities, and employment opportunities present in the community.

(2) *Relationships*: Parental characteristics (mental health, irritability, coping skills, efficacy, and physical health), support networks available to parents, parental behavior (responsivity/warmth, harshness/control, and supervision/monitoring), and the quality and structure of the home environment.

(3) *Norms/collective efficacy*: The extent to which community-level formal and informal institutions exist to supervise and monitor the behavior of residents, particularly youths' activities (deviant and antisocial peer-group behavior) and the presence of physical risk (violence and victimization and harmful substances) to residents, especially children and youth.

The theoretical models proposed here, in contrast to the models proposed by Jencks and Mayer (1990), are complementary rather than conflicting. Their utility may depend largely on the outcome under investigation, with norms/collective efficacy most useful for studying delinquency, institutional resource models most appropriate for investigating achievement outcomes, and relationships (which perhaps cuts across the two models) most salient for addressing community-level processes. A discussion of these different pathways of influences follows. We draw on the literature from quantitative studies as well as presenting some of the insights

from the ethnographic literature (see also Burton & Jarrett, in press, for a review of this literature focusing on the family). An attempt is made to identify the level of such mechanisms (individual, family, school, peer, community) and the processes through which they may operate.

In general, the research findings presented here are too scant to draw any firm conclusions about the potential pathways through which neighborhood effects may be transmitted to children and adolescents. The strongest evidence is provided for norms/collective efficacy, in particular, peers as potential mediators and moderators of neighborhood effects on adolescents, as well as informal social control as a community-level mediator of adolescent behavior. The link between low SES and adolescent delinquent and problem behavior, reported in the previous section, may result from a lack of community institutions to monitor the activities of children and youth. The norms/collective efficacy model, drawing largely from social disorganization theory, is perhaps the most theoretically sound model as well. Evidence is also growing for models of relationships, specifically, parental behavior as a mediator of neighborhood effects. However, Cook et al. (1997) suggested that some family processes may vary more across families than neighborhoods and thus may act more as a moderator of neighborhood influences. Although little empirical evidence exists for institutional resource models, earlier work by Jencks and Mayer (1990) indicated that schools are an important resource for developmental outcomes; the positive association between high SES and achievement outcomes, noted in the last section, provides additional evidence for this hypothesis. Clearly, much more work needs to be done in the area of pathways to better understand the processes through which neighborhoods influence children and adolescents.

Availability of Institutional Resources

The availability, accessibility, affordability, and quality of several types of resources in the community—learning, recreational, and social activities; child care; schools; medical facilities; and employment opportunities—could influence child and adolescent outcomes. In terms of the Jencks and Mayer (1990) framework, we are combining the presence of institutional resources and the extent to which residents compete for them into a single mechanism because it is difficult to distinguish empirically between these two models. We focus on the existence of institutional resources in neighborhoods and attributes of available resources that in turn could affect children, youth, and families. Community-level analyses linking these resources to child and adolescent development are rare; thus, we draw on relevant research on each of these resources and limited empirical data on community resources to suggest how these mechanisms might affect child and adolescent well-being.

The presence in the community of learning activities, such as libraries, family resource centers, literacy programs, and museums, that parents can draw on for their children's learning stimulation may influence children's development, especially school readiness and achievement outcomes. One study with 3-year-olds from the IHDP, however, found that learning experiences outside the home did not mediate neighborhood effects on children's school readiness, whereas learning experiences inside the home did (Klebanov et al., 1998). Of course, further investigation of this premise is

warranted, particularly with older children who may have more ready access to public resources. In addition to educational resources, the availability of organized social and recreational activities (e.g., parks, sports programs, art and theater programs, community centers, children and youth groups) for parents to draw on may promote their children's physical and socioemotional well-being. However, access to these resources may be problematic in low-to-moderate-income neighborhoods that are racially and ethnically mixed if these resources are racially/ethnically based and if families are reluctant to participate in activities that are dominated by members of another racial or ethnic group (Jarrett, 1997; Korbin & Coulton, 1997).

An ethnographic study by Jarrett (1997) revealed that in neighborhoods with few recreational, learning, or cultural activities, some parents use resource-seeking strategies for their children that maximize local as well as extralocal resources. In essence, parents go outside their neighborhoods to obtain these resources for their children. This strategy is likely to affect both cognitive and behavioral functioning by restricting children's activities in the neighborhood and providing them with stimulating alternatives outside the neighborhood; this technique may be adaptive for children and adolescents. In fact, analyses by Elder, Eccles, Ardel, and Lord (1995) suggest that among African American families residing in disadvantaged neighborhoods, the use of such resource-seeking strategies to promote children's and youth's development may be more common than restrictive practices (which limit access to external resources).

The accessibility, affordability, and quality of child care available to families in the neighborhood is another institutional resource that may act as a mediator of neighborhood effects on young children's outcomes. The characteristics of child care available in the community have implications for children's learning experiences, behavioral functioning, and physical health. High-quality child care and early intervention programs have been shown to have long-term positive effects on children's cognitive and socioemotional outcomes and, to a lesser extent, on parenting outcomes (Benasich, Brooks-Gunn, & Clewell, 1992; Brooks-Gunn, Berlin, & Fuligni, *in press*; Campbell & Ramey, 1994; Lee, Brooks-Gunn, & Schnur, 1988; Lee, Brooks-Gunn, Schnur, & Liaw, 1990; McKey et al., 1985; Reynolds, 1994; Yoshikawa, 1994; Zigler, 1987). Lower quality child care is associated with lower adult-to-child ratios that may lead to less supervision, increased tolerance of aggressive behavior, and potential child injuries (Hayes, Palmer, & Zaslow, 1990). Unfortunately, for many low-income families, child care is not accessible or affordable and tends to be of lower quality, but child care may be most problematic for low- and middle-income working families who do not qualify for most government and nonprofit sponsored programs, such as Head Start (Hofferth, 1995; National Institute of Child Health and Human Development Child Care Network, 1997). Recent work by Fuller, Coonerty, Kipnis, and Choong (1997) indicated that the quantity and quality of child care in poor neighborhoods is especially problematic. Thus, the extent of child care in the neighborhood could mediate the association between neighborhood disadvantage and children's development and may be a resource for which residents compete.

Among older children and adolescents, schools are a salient institutional resource that could be a potential mechanism of neighborhood influences, especially for adolescents, because

schools may be a more proximal environment than the neighborhood. Neighborhood resources may contribute to developmental outcomes in terms of characteristics of the school environment, such as quality, climate, and demographics, if school characteristics are shaped by the social and economic makeup of neighborhoods (see Jencks & Mayer, 1990, for a review). Support for this view is provided by the MTO Study. Ludwig and Ladd (1997), using data from the Baltimore program site, found that children and youth who moved from public housing to neighborhoods with few poor residents (treatment group), as well as children and youth who predominantly moved to neighborhoods with moderate numbers of poor residents (Section 8 comparison group), were more likely to attend schools with higher pass rates on achievement tests than did their peers who remained in public housing in high-poverty neighborhoods (in-place control group). Differences in the school environment were attributable largely to the presence of more resources and more advantaged student populations. Most studies have not examined school and neighborhood characteristics simultaneously to see if school-mediated neighborhood effects exist. One study of fifth and sixth graders in the Midwest found that school characteristics (reported availability of substances, acceptance of substance use, school safety, and school attachment) partially mediated the association between neighborhood characteristics (reported neighborhood attachment and safety; census measures of population mobility and population density) and school rates of lifetime alcohol and cigarette use (Ennett et al., 1997). Another study found that among youth in the Philadelphia Teen Survey, once school norms and attitudes toward sexual initiation and parenting were accounted for, neighborhood attributes (median income, poverty, female family-headship, and teen fertility rate) were not associated with neighborhood-level differences in adolescent sexual activity (Teitler & Weiss, 1996). Thus, the increased prominence of school during the adolescent years may make it a powerful mediator of neighborhood effects on adolescent outcomes.

Access to medical services is another community resource that may mediate neighborhood effects on children's and adolescents' physical and mental health. Unfortunately, most researchers examining the link between health outcomes, such as low birth weight, injury, and maltreatment, and neighborhood sociodemographic characteristics do not include the extent of medical (and social) services available in the community in their analyses. Although not explicitly investigating this premise, a recent IHDP study found that across the first 3 years of life, residence in poor and middle-income neighborhoods was associated with more emergency room visits than residence in affluent neighborhoods, and families in middle-income neighborhoods reported more doctor visits than families in poor or affluent neighborhoods (Brooks-Gunn, McCormick, Klebanov, & McCarton, 1998). These findings suggest that access to particular types of medical services may vary by neighborhood SES (effects were found controlling for family characteristics, including income).

The final community resource, especially relevant for adolescents, is opportunities for employment in the community. Unlike the other resources discussed, employment may operate at two levels: The first is actual employment opportunities available in the community (a community-level mediator), and the second is adolescents' expectations regarding opportunities for employment (an individual-level mediator). The latter aspect of employment

opportunities maintains parallels with Jencks and Mayer's (1990) models of collective socialization and relative deprivation in that individuals are weighing their own options against those of neighbors, relatives, and peers in the surrounding community. Consequently, adults in the neighborhood may act as role models for children and youth.

Studies with large survey samples tend to emphasize the negative developmental consequences of adolescent employment, such as increased problem behavior and alcohol and drug use (Bachman & Schulenberg, 1993; Greenberger & Steinberg, 1986; Mortimer, Finch, Ryu, Shanahan, & Call, 1996; Steinberg & Dornbusch, 1991; Steinberg, Fegley, & Dornbusch, 1993). However, researchers targeting low-income youth acknowledge the benefits of employment during adolescence, such as economic gains and adult monitoring, that can result in increased school engagement and decreased criminal and delinquent behavior (Gleason & Cain, 1997; Leventhal, Graber, & Brooks-Gunn, 1995; Newman, 1999; Sullivan, 1989). Thus, opportunities for employment available in the community could mediate neighborhood influences on adolescent outcomes by curtailing access to resources or by providing access to resources, depending on the neighborhood context. In low-income neighborhoods, employment opportunities for youth may be few and far between (Newman, 1999; Wilson, 1997). Minority youth in such neighborhoods are particularly vulnerable to fluctuations in the local labor market and may also encounter residential and racial discrimination that hinders their employment outcomes (Freeman, 1991; Iceland, 1997; Kirschenman & Neckerman, 1991; Lewin-Epstein, 1986; Osterman, 1991). Among predominantly minority families in the Gautreaux Project, youth and mothers who moved to the suburbs were more likely to be employed than their counterparts who remained in the city (Kaufman & Rosenbaum, 1992; Popkin, Rosenbaum, & Meaden, 1993; Rosenbaum et al., 1988; Rosenbaum & Popkin, 1991). For mothers, no differences were found with respect to wages earned between suburban movers and city stayers, but for youth, suburban movers earned higher wages and were more likely to have jobs that offered benefits than their peers who remained in the city.

It is also likely that children's and adolescents' expectations about the employment opportunities available to them are shaped by the immediate neighborhood context. These expectations and aspirations are influential in determining how children and adolescents experience the transition into adulthood. In disadvantaged communities, the traditional view of education and the American work ethic, although espoused, does not necessarily jibe with the daily lives of many youth from these communities. How children and adolescents reconcile these contradictions could subsequently alter young adult outcomes, such as schooling, teenage sexual activity and fertility, criminal activity, and substance use (Billy et al., 1994; Ogbu, 1991; Paulter & Lewko, 1987; Willis, 1977).

Relationships

Parental relationships may mediate the association between child and adolescent well-being and neighborhood characteristics through parental characteristics and support networks available to parents, parental behavior, and the home environment. Our relationship model overlaps to some extent with Jencks and Mayer's (1990) model of collective socialization, particularly in the areas of parental supervision and monitoring and the presence of routines

and structure. Although families are a primary context for children and adolescents, they may be a more powerful mediator of neighborhood influences among young children who have more limited access to neighborhoods and other contexts than do older children.

The parental characteristics thought to influence neighborhood effects on children and youth are mental health, irritability, physical health, coping skills, and efficacy. Specifically, models developed from the literature on family low income and parental unemployment suggest that possible pathways exist, at least from family-level variables, such as economic hardship and financial strain, to child outcomes through parental characteristics, such as stress and depression, which then influence parenting behavior (Conger, Ge, Elder, Lorenz, & Simons, 1994; McLoyd, 1990; McLoyd, Jayaratne-Epstein, Ceballo, & Borquez, 1994). Parents' relationships moderate or mediate the influence of their mental and physical health on subsequent parenting and child development and are important for parental active coping and efficacy. There are only a few studies of neighborhood effects on parents' mental health. Among IHDP families, neighborhood poverty and affluence were not associated with mothers' levels of depression or coping skills (Klebanov et al., 1994). Using the family stress model, Elder et al. (1995) examined families residing in poor neighborhoods and found that levels of parental efficacy mediated the use of family management strategies (monitoring and supervision) within both the home and the community among African American parents but not among European American parents (effects on adolescents' development were not examined). Thus, theoretically, it is reasonable to hypothesize that neighborhood disadvantage could influence parental mental and physical health and resultant child outcomes by way of parenting.

Among parents, access to family and friends or social connections within the neighborhood has been hypothesized to intervene between neighborhood economic resources and child outcomes (Cook et al., 1997). The amount of social support available to parents might reduce parental stress associated with living in a dangerous and impoverished neighborhood and, in turn, reduce the negative effects of parental stress on children (Conger et al., 1994; Elder et al., 1995; McLoyd, 1990). Alternatively, friends and especially family members in the neighborhood might be used for child care when parents are unavailable to monitor children (Logan & Spitze, 1994). Klebanov et al. (1994) found that social support was low in affluent and low-income neighborhoods as compared with middle-income neighborhoods in the IHDP. Among minority, low-income families in the Yonkers Project, however, no differences in social support were found between families who stayed in low-income neighborhoods and families who moved to middle-income neighborhoods (Briggs, 1997a, 1997b). At the community level, several studies have found that regardless of neighborhood SES, neighborhoods designated as high risk for child maltreatment were lacking social resources compared with neighborhoods considered low risk (Deccio, Horner, & Wilson, 1994; Garbarino & Kostelny, 1992; Garbarino & Sherman, 1980; Korbin & Coulton, 1997; Vinson, Baldry, & Hargreaves, 1996).

Turning to the findings on parent-child relationships, in particular, parenting behavior, two dimensions are thought to be possibly influenced by neighborhood of residence, over and above family characteristics such as income, family structure, maternal education, maternal age, and race/ethnicity. These parenting dimensions are responsivity/warmth and harshness/control. For ex-

ample, in a sample of young children, Klebanov et al. (1994) found that living in neighborhoods with a high proportion of poor residents was associated with lower maternal warmth than residing in neighborhoods with a high proportion of middle-income residents. There is also some evidence from a study that explicitly examined indirect neighborhood effects on adolescent problem behavior. The negative influence of community disadvantage, as measured by census data, on adolescent boys' psychological distress was mediated by the overall quality of parenting (monitoring, warmth/support, inductive reasoning, harsh discipline, hostility, and communication), assessed by means of videotaped parent-child interactions (Simons et al., 1996). In addition, several ethnographers have suggested that parents who reside in impoverished and dangerous neighborhoods may be less warm and more controlling with their children than parents in more advantaged and safe neighborhoods (Furstenberg, 1993). This behavior is thought to be somewhat adaptive because it teaches children to protect themselves from potential harm in the neighborhood.

Several empirical studies have also linked neighborhood characteristics to harsh and controlling parenting practices. Earls, McGuire, and Shay (1994) found that parents who reported living in more dangerous neighborhoods also reported using more harsh control and verbal aggression with their children than did parents who resided in less dangerous neighborhoods. In the Yonkers Project, parents who moved to middle-income neighborhoods reported using less harsh disciplinary techniques with young children than did parents who stayed in the low-income neighborhoods (Briggs, 1997a). Though the processes through which neighborhood change influenced parenting were not explored, according to models of economic hardship and parental stress, as outlined by Conger et al. (1994) and McLoyd (1990), moving to a less dangerous and impoverished neighborhood could have reduced parental stress and/or depression and, in turn, led to less harsh parenting practices. Additional studies based on participant reports found that links between parental control and adolescents' grade point averages, deviant behavior, and psychosocial development varied somewhat by neighborhood context, such that low parental control was more beneficial to adolescents in low-risk neighborhoods and moderate to high parental control had more positive effects for youth in high-risk neighborhoods (Gonzales, Cauce, Friedman & Mason, 1996; Lamborn, Dornbusch, & Steinberg, 1996). From the parenting literature, the early work of Baumrind (1972) indicated that authoritarian parenting behavior (high control, low warmth) was more likely to be displayed with African American urban female preschoolers than with Baumrind's original sample of European American boys and girls. This study, however, was based on 16 girls and did not explicitly test neighborhood effects. Despite these caveats, Baumrind's study has been widely cited as evidence that more controlling behavior is necessary and likely in poor neighborhoods.

Parental supervision and monitoring are related to parental control. The extent to which parents supervise/monitor their children's activities may mediate neighborhood effects by increasing or decreasing children's and youths' exposure to the neighborhood, which could have a positive or negative effect on well-being depending on the characteristics of the neighborhood. Qualitative scholars suggest that family residence in a dangerous and impoverished neighborhood is associated with more restrictive parenting practices (Anderson, 1991; Burton, 1990; Furstenberg, 1993; Jar-

rett, 1997). For example, the ethnographic accounts of Jarrett (1997) suggest that parents in poor neighborhoods often use "bounding" techniques that restrict children and youth to the home environment and limit access to neighborhood influences, particularly peers. There is also some related empirical support for this premise. In the Yonkers Project, parents who moved to middle-income neighborhoods used less restrictive monitoring practices with adolescents than did parents who stayed in the low-income neighborhoods (Briggs, 1997a). A study examining indirect neighborhood effects in a sample of older adolescent females found that the association between residence in a high-SES neighborhood and reduced rates of pregnancy, as well as the association between residence in a low-SES neighborhood and increased rates of pregnancy, was mediated by parental control (or monitoring) of early dating behavior (Hogan & Kitagawa, 1985). Although these qualitative and quantitative studies concur with the suggestion of Baumrind (1972), the underlying premise of mediated neighborhood effects remains to be further tested.

Several characteristics of the home environment are thought to be associated with indirect neighborhood effects on children and youth—the provision of learning experiences, the physical environment, the presence of routines and structure, and the level of violence. The provision of learning experiences in the home includes reading to or with the child, the presence of books and other reading materials in the home, the presence of some work space for the child, age-appropriate toys/games for the child, and the inclusion of the child in household responsibilities (Bradley, 1995; Caldwell & Bradley, 1984). A study using two samples of young children found that the benefit of residing in a high-SES neighborhood on children's IQ, verbal ability, and behavior problems scores was accounted for by the quality of the home learning environment, even after controlling for family characteristics (Klebanov et al., 1997). Further, children in less advantaged neighborhoods were less likely to benefit from the provision of learning experiences in the home. In addition, the negative association between living in a racially and ethnically diverse neighborhood and children's verbal ability was mediated by the quality of the home learning environment, even after controlling for family differences. In a more recent study, Klebanov et al. (1998) separated out items from the Home Observation for Measurement of the Environment scale (Caldwell & Bradley, 1984) to examine the relative importance of home learning experiences inside the home versus outside the home. These analyses demonstrated that it is the provision of learning experiences inside the home, and not outside the home, that mediated neighborhood effects on 3-year-old children's IQ scores. Another study found that the adverse effects of neighborhood risk (assessed by participant report) on early school-age children's teacher-reported social competence, authority acceptance, and standardized reading achievement scores were partially mediated by the quality of the home environment (controlling for child and family characteristics; Greenberg, Lengua, Coie, & Pinderhughes, 1999).

The physical environment of the home entails attributes such as safety, cleanliness, space allocation, and lighting (Caldwell & Bradley, 1984). Not surprisingly, living in a poor neighborhood (as opposed to a middle-income neighborhood) is associated with lower quality physical home environments, even after controlling for maternal and family characteristics (Klebanov et al., 1994). The quality of the physical environment of the home is likely to

have the largest impact on children's and adolescents' physical health. In one study, residing in a low-income neighborhood was associated with higher rates of child injury, likely due in part to unsafe play areas within the home (Durkin, Davidson, Kuhn, O'Connor, & Barlow, 1994).

Routines and structure created by parents, such as regular meal-times and bedtimes, are hypothesized to be an important part of children's lives (Boyce, Jensen, James, & Peacock, 1983; Bradley, 1995). At the theoretical level, Wilson (1987, 1991) has argued that the presence of routines is lacking in many poor communities because of the breakdown in social structure. The link between neighborhood effects and child outcomes by way of routines has not been empirically examined, although it is central to models of community socialization as proposed by Wilson (1987).

Although possibly related in part to parental behavior, children's exposure to violence in the home as either a witness or a victim also may mediate neighborhood effects on children and youth, particularly mental and physical health. A study of a poor urban community found that children were exposed to high levels of violence within both the community and the home (Martinez & Richters, 1993; Richters & Martinez, 1993). Further, a community-level analysis of child maltreatment found a higher occurrence of stressful life events in neighborhoods at greater risk for child maltreatment (Garbarino & Kostelny, 1992). The intersection of violence in the home and violence in the community is beginning to be studied in the PHDCN (F. Earls, personal communication, November 5, 1999; see Kindlon, Wright, Raudenbush, & Earls, 1996; Selner-O'Hagan, Kindlon, Buka, Raudenbush, & Earls, 1998, for methodological work underway).

Norms/Collective Efficacy

This model is drawn largely from social disorganization researchers who suggest that community structural characteristics, most notably, low SES, residential instability, and ethnic heterogeneity, determine the extent of formal and informal institutions that are present to supervise and monitor the activities of residents (particularly youth, which may promote or impede problem behaviors among peers as well as other deviant behaviors among residents). Although supervision and monitoring are also discussed under relationship models, clearly other adults or institutions in the neighborhood can be involved in the supervision/monitoring of children and youth. Thus, here we discuss community-level mechanisms of control, as well as the processes through which such institutions may come into place. In addition, the existence of such community-level institutions may be required to regulate the proliferation of physical risk to residents (especially children and youth), including levels of violence and victimization, the availability of harmful or illegal substances, and other threats to physical well-being. Under the rubric of Jencks and Mayer (1990), the norms/collective efficacy model combines models of collective socialization and contagion but limits the mechanisms of influence to community-level processes as opposed to family- and/or individual-level behavior. Even though it may be possible to distinguish empirically between these models, many of the potential mechanisms of influence overlap, in particular, peer groups or local residents. Further, contagion models in general do not specify how negative peer influences operate.

As noted, norms/collective efficacy models address the social organizational characteristics of neighborhoods, in particular, formal and informal institutions or control and regulatory mechanisms. Recently, scholars have begun to reassess what aspects of community social organization are most relevant for studying child and family well-being (see Sampson, in press, for a review). Today, social networks, which include psychological support, interpersonal and intergenerational ties, and mutual exchange, extend well beyond the neighborhood of residence to larger geographic locales. Thus, social connections within the neighborhood of residence may need to be redefined. According to Sampson (in press), a more realistic and theoretically valid conception of community social structure could include shared values of mutual trust, safety, the willingness to intervene for the common good, and supportive childrearing, rather than the mutual exchanges of more geographically diffuse social networks. The local community or neighborhood of residence, however, still remains important because resources are not distributed equally across neighborhoods, as large spatial differences in community levels of income, education, stable housing, and employment continue to exist.

The social connections in neighborhoods that arise out of mutual trust and shared values among residents are being studied in the PHDCN, using the term *collective efficacy*, as discussed by Bandura (1986; Sampson et al., 1997). Collective efficacy describes the extent of social connections in the neighborhood and the degree to which residents monitor the behavior of others in accordance with socially accepted practices and with the goal of supervising children and maintaining public order. Essentially, collective efficacy is a combined measure of informal social control and social cohesion obtained from a community survey. In the PHDCN, informal social control was assessed by items such as the likelihood that neighbors could be counted on to intervene in various situations, including children skipping school, a fight in front of their house, and threats to close the local fire station because of budget cuts. Social cohesion was evaluated by items such as how strongly residents agreed that people are willing to help neighbors, the neighborhood is close-knit, and residents share values. An important distinction to keep in mind is that collective efficacy is the ability of neighborhoods to implement informal and formal institutions to monitor the activities of children and youth rather than the accumulation of social resources that occurs within social networks.

To date, Sampson et al. (1997) have found a negative association between collective efficacy and community violence and that collective efficacy mediated the positive association between neighborhood structural factors (concentrated poverty and residential instability) and community rates of violence. Thus far, the researchers have not examined whether this construct is linked to individual-level outcomes or even parenting behavior. According to social disorganization theory, collective efficacy (or informal social control) is critical for supervising and controlling adolescent peer groups, in particular, the formation and proliferation of gangs (Sampson & Groves, 1989; Shaw & McKay, 1942; see also Sampson, 1997). A recent study using a neighborhood-based design across two cities (Denver and Chicago) provided some evidence that informal social control (measure included mutual respect, institutional controls, neighborhood bonding, and perceived informal control) is negatively associated with adolescent problem behavior after accounting for individual characteristics (Elliott et

al., 1996). In addition, informal control mediated the effect of neighborhood structural disadvantage (declining poor neighborhoods), as assessed by census data, on adolescent delinquency, as well as prosocial competence and conventional friends (i.e., non-delinquent activities). In yet another study based in Chicago, a measure of informal social control of children was negatively associated with community rates of adolescent delinquency, both assessed by means of a community survey (Sampson, 1997). Informal social control of children also mediated the negative association between residential stability (census measure) and adolescent rates of delinquency. Finally, one study found that the positive association between neighborhood low SES and adolescent depression was accounted for by low neighborhood social cohesion (Aneshensel & Sucoff, 1996).

Social disorganization theory suggests that peers may be the primary agent through which community socialization adversely affects adolescents (Sampson, 1992; Sampson & Groves, 1989; Shaw & McKay, 1942). Peer influences are hypothesized to operate largely as a result of a lack of community institutions (formal and informal) to regulate peer group behavior. Although it has been suggested that peers may play a more prominent role in the lives of older children and adolescents, peer influences at the neighborhood level may begin as early as preschool. Specifically, researchers found that preschool children had the greatest amount of peer contact with and exposure to aggressive peers in their neighborhoods as opposed to other contexts (e.g., child-care setting, family event, organized play group), and low-SES children and children from single-parent families were most likely to be exposed to aggressive peers in the neighborhood (Sinclair, Pettit, Harrist, Dodge, & Bates, 1994). Such play may be more permissible when it is unstructured and unsupervised. Consistent with findings on younger children, a study of early adolescents found that close friends of antisocial boys tended to live in the same neighborhood and to have more unstructured and unsupervised activities (Dishion, Andrews, & Crosby, 1995). Among youth in the Yonkers Project who moved to middle-income neighborhoods, it was youth with high levels of problem behavior that maintained strong ties with peers in the old, low-income neighborhoods (Briggs, 1997a).

In accordance with these findings, several quantitative studies have found that peers mediate as well as moderate neighborhood effects. Studies of adolescents indicate that in socially disadvantaged neighborhoods, fewer informal and formal social networks exist for youth (i.e., organized activities), which, in turn, may be associated with delinquency, problem behavior, prosocial competence, and negative peer group affiliation (Elliott et al., 1996; Sampson & Groves, 1989). Other studies have examined the role of peers but not unsupervised activities. Peer deviance was negatively associated with adolescents' school achievement (grade point averages) in one study (Darling & Steinberg, 1997), and in another study, peer deviance mediated the negative effect of neighborhood disadvantage on adolescents' mental health (Simons et al., 1996). Peer support has been shown to moderate neighborhood effects on antisocial behavior, substance use, and school achievement (Dubow, Edwards, & Ippolito, 1997; Gonzales et al., 1996). Across this research, high levels of peer support appeared to have more beneficial effects in low-risk neighborhoods and more detrimental effects in high-risk neighborhoods.

The presence of risk at the neighborhood level, particularly, danger, violence, and crime, as well as illegal or harmful substances, also may influence child and adolescent development. Such risks are likely to be more widespread when collective efficacy is low and norms are lacking. The prevalence of neighborhood danger and violence in the lives of children and families residing in poor neighborhoods is clear from two housing programs that relocated public housing residents to less poor neighborhoods (MTO and Yonkers). Despite policymakers' emphasis on parental employment and children's schooling in these programs, parents reported safety for their children as the most salient reason for deciding to move (Briggs, 1997a; United States Department of Housing and Urban Development, 1996). In an evaluation of a community intervention to reduce child maltreatment, Earls et al. (1994) found that perceptions of danger within the neighborhood were associated with lower ratings of the quality of the neighborhood as a place to live and raise children, as well as lower ratings of community attachment. Another study of adolescents examined danger as a potential mechanism underlying the effect of neighborhood SES on adolescents' mental health and found that youth in low-SES neighborhoods perceived greater danger than their peers in high-SES neighborhoods and that perceptions of neighborhoods as dangerous negatively influenced their mental health (Aneshensel & Sucoff, 1996).

In aggregate analyses of community outcomes in Cleveland, Coulton et al. (1995, 1996; Korbin & Coulton, 1997) have found that neighborhood characteristics, measured by means of census data and thought to be associated with community social organization (impoverishment, residential instability, and child-care burden), were associated with community-levels of maltreatment. Child maltreatment rates were associated with other indicators of social organization, including low birth weight, violent crime, drug trafficking, and juvenile delinquency (Coulton et al., 1995). Similarly, in a study of community outcomes in Chicago, Daly (1997) found associations between neighborhood SES, life expectancy, homicide rates, and reproductive timing. Residing in low-income neighborhoods is also associated with higher rates of child injury, which are likely due in part to unsafe play areas outside the home as well as limited opportunities to engage in organized extracurricular activities (Durkin et al., 1994).

Several studies have suggested that there is variation in access to substances across neighborhoods, which may be associated with the presence of community institutions to monitor the behavior of residents. For example, in the Yonkers Project, youth who stayed in the low-income neighborhoods had greater access to alcohol than did adolescents who moved to middle-income neighborhoods, as assessed by the number of liquor stores in the community (Briggs, 1997b). Although no direct links were examined with respect to access to substances and adolescent outcomes, youth who remained in low-income neighborhoods were more likely to report having used alcohol and marijuana than were youth who moved to middle-income neighborhoods (Briggs, 1997b). Another study found that in predominantly middle-income neighborhoods, African American adolescents were more likely to be sold cigarettes than were European American adolescents and that African American youth were more likely to be sold cigarettes in neighborhoods with high concentrations of African Americans (Landrine, Klonoff, & Alcaraz, 1997). Again, no empirical links were made to child development. However, among older children, high

levels of drug activity in the neighborhood have been found to be associated with increased school rates of current cigarette use (Ennett et al., 1997).

An Emerging Framework for Research on the Developmental Significance of Neighborhoods

This concluding section addresses the answers to the questions that we posed in the introduction to this article and that subsequently framed the review. Further, an attempt is made to integrate the information provided in the different sections of this review, as is practically required in the field of neighborhood research. We also include prescriptions, as well as questions, for the next generation of neighborhood researchers.

What Is to Be Learned From Census Data?

The accessibility of census data, coupled with the resurgence of interest in neighborhoods, has led many social scientists to undertake neighborhood research. Census data can provide evidence about the structural characteristics of neighborhoods that matter most for children and youth. On the basis of our review, the structural dimensions of most theoretical importance are SES, residential stability, and racial and ethnic diversity. A three-part classification of SES into high SES, middle SES, and low SES is required to examine the effects of poor and affluent neighborhood residence (in comparison to middle-income neighbors). Current research reviewed, using factor analyses or cluster analyses, confirms the salience of these structural characteristics in both national and regional studies. In addition, these structural dimensions are associated with child and adolescent well-being. At the aggregate or neighborhood level,⁴ neighborhoods that are composed of many poor residents, that are not residentially stable, and that have high concentrations of racial and ethnic minorities are likely to have relatively high rates of crime, juvenile delinquency, low-birth-weight infants, infant mortality, morbidity, and child physical abuse (Collins & David, 1990; Coulton et al., 1995; Daly, 1997; Drake & Pandey, 1996; O'Campo et al., 1997). As Sampson (in press) pointed out, these negative neighborhood indicators of well-being often occur in "bundles."

What Neighborhood Dimensions Are Most Important for Child Development?

With respect to individual-level outcomes (rather than the neighborhood-level indicators of well-being discussed above), our review of the neighborhood findings to date provides evidence for links between neighborhood SES and residential stability with achievement, behavior problems, juvenile delinquency, and to a lesser extent, teenage sexuality and childbearing. Across all of the outcomes, SES appeared to matter most, although the particular indicator of SES that mattered most varied by outcome. The strongest evidence was provided for the importance of high-SES neighborhoods for achievement outcomes among both children and adolescents. Low-SES neighborhoods and residential stability mattered most for adolescent juvenile delinquency. Low-SES neighborhoods also seemed to be associated with young children's externalizing behavior problems (such problems have been linked to subsequent criminal and delinquent behavior; McCord, 1990).

Employment indicators were most strongly associated with adolescent sexuality and fertility outcomes. In addition, variation of neighborhood effects by race/ethnicity and gender have been reported. The benefit of high-SES neighborhoods may be more salient for European American children and youth than for African Americans. This finding may be due to the fact that African American children who reside in affluent neighborhoods are more likely to be living in closer geographic proximity to less affluent neighborhoods (i.e., larger environments that are more disadvantaged), in contrast to their European American peers, who, although residing in similarly affluent neighborhoods, are in closer geographic proximity to other affluent neighborhoods (i.e., larger environments that are more advantaged; Sampson, Morenoff, & Earls, in press). The consequence of this discrepancy in the larger environments in which European American and African American children live is that the influence of neighborhood characteristics, such as high SES, may have less impact on the well-being of African American children than on that of European American children. In terms of gender differences in neighborhood effects, the most consistent discrepancy observed was that the beneficial effects of neighborhood high SES on adolescents' achievement may be more pronounced for boys than girls. This pattern suggests that adolescent boys may be more susceptible to environmental influences than are adolescent girls. Overall, these findings suggest that SES (defined in terms of high, middle, and low) and residential stability are good investments for neighborhood indicators of child well-being. Further, in selecting neighborhood dimensions, we urge researchers to err on the side of fewer conceptually selected neighborhood dimensions because of problems of multicollinearity among neighborhood dimensions, especially in city-based samples.

What Is the Strength of Neighborhood Effects?

We can estimate the strength of neighborhood effects by the amount of variance accounted for by neighborhood dimensions or by effect sizes. The effect sizes reported for neighborhood structural influences (measured by means of census data) in this review were surprisingly consistent in the national studies and the regional studies with neighborhood-based designs, at least for achievement and high SES and for juvenile delinquency and low SES and residential instability. Neighborhood effects were small to moderate and accounted for about 5% of the variance in child outcomes, after controlling for a host of family-level characteristics (family income, family structure, maternal education, maternal age, and race/ethnicity). In the IHDP, for instance, the effect size for neighborhood affluence on children's IQ scores at age 5 was .13 (or 1.6 IQ points) compared with the effect size for average family income to needs, which was .32 (or 3.6 IQ points); the former accounted for 1% of the variance and the latter for 5% of the variance (Duncan et al., 1994). Clearly, the effect sizes range from small to moderate and translate into relatively small percentages of explained variance, which, nonetheless, reflect meaningful differences in IQ scores across the different independent variables. Thus, this example illustrates the importance of linking percentage of variance, effect sizes, and actual differences when discussing

⁴ Note that this review did not focus on such studies.

effect sizes. Duncan and Raudenbush (1999) suggested that from a policy perspective, the effect sizes that program evaluators consider moderate (.4) or large (.6) translate into relatively small proportions of variance in child outcomes explained by neighborhood residence. However, such effect sizes do not preclude the potential for effective neighborhood interventions, because cost-effectiveness is determined by the effect size relative to cost.

What Designs Should Be Used to Study Neighborhood Effects?

Associations between neighborhood structural dimensions and child development were found in studies that included the entire range of neighborhood structural characteristics. Nationally representative samples of families or individuals, by definition, meet this requirement, as do studies that, although not nationally representative, are multisite and have families who are affluent, middle income, and poor. The PSID and NLSY-CS are examples of the former, and the IHDP is an example of the latter. In addition, regional or city-based studies that were designed to maximize variation in neighborhoods also found neighborhood-level effects. Examples include the studies by Elliott et al. (1996) in Denver and Chicago, by Sampson et al. (1997) in Chicago, by Furstenberg et al. (1999) in Philadelphia, and by Cook et al. (1997) in Prince George's County, Maryland. City or local studies that were not designed to capture a range of neighborhood conditions are not appropriate for studying neighborhoods and, by and large, do not find neighborhood effects. We strongly recommend that neighborhood analyses be limited to nationally representative (or multisite large studies with the entire range of family SES) and to regional or city-based studies in which sampling is done to ensure adequate representation of all neighborhoods. Further, we recommend that the nationally representative studies have no more than 3 families per census tract to minimize threats to the independence of neighborhood dimensions. Specifically, in national or multisite studies, too many cases per neighborhood or even per cluster of like neighborhoods (close in terms of geographical proximity and similar demographically) may lead to high multicollinearity among neighborhood dimensions, making an examination of neighborhood effects problematic (Duncan, Connell, & Klebanov, 1997). National or multisite studies that meet this qualification are also amenable to sibling analyses and instrumental variable approaches, statistical techniques for minimizing the problem of omitted variable biases (absence of important but unmeasured individual, family, or neighborhood characteristics). In contrast, in the city-based studies, it is preferable to sample at least 15 to 30 individuals or families per census tract or neighborhood cluster to conduct multilevel modeling (Duncan & Raudenbush, 1999). The exceptions to this rule are the use of experimental designs and the random selection of neighborhoods on the basis of designated criteria. These requirements, again, suggest that conducting neighborhood-based studies is unlikely to be done ad hoc. In other words, we recommend that studies examining a set of neighborhoods without prior selection for neighborhood effects and without a range of neighborhoods (e.g., SES) not be used to analyze neighborhood effects.

How Are Neighborhood Processes Studied?

To understand the processes through which structural characteristics might have an impact on families or individuals, which is required to test theoretically based predictions, it is necessary to go beyond census data. First, selective use of administrative data is recommended to tap neighborhood processes. Perhaps the most useful source, given the current focus on social control and disorganization, is data on crime available from uniform crime reports, which are filled out by police departments (see, e.g., Sampson et al., 1997). Administrative data are not only useful theoretically but are collected more frequently than census data, making them ideal for modeling change (i.e., the difficulty of looking at temporality in cases such as links between structural characteristics of a neighborhood, crime rates, and social control) and for ruling out (at least in part) some aspects of selection bias. Other administrative data may be useful for examining other neighborhood processes. For example, the incidence of low birth weight in a community, measured from vital statistics maintained by state and county health departments, might be used to understand what neighborhood social organizational features are linked to low levels of prenatal care use or high levels of smoking within a neighborhood (see, e.g., S. Buka, personal communication, November 5, 1999). A third example is child abuse and neglect rates available from departments of human and social services, which can be used to identify neighborhood structural dimensions associated with child maltreatment, such as poverty and instability, as well as familial processes associated with abuse and neglect, such as punitive parenting and low levels of social networks among parents of young children (see, e.g., Coulton et al., 1995; Korbin & Coulton, 1997; Garbarino & Kostelny, 1992; Garbarino & Sherman, 1980).

Beyond administrative data sources, the two most promising avenues for collecting process data are community surveys and systematic social observation. A community survey requires large enough samples within neighborhoods to examine within- and between-neighborhood variance in such processes (approximately 15 to 30 respondents per neighborhood). In addition, the sample obtained for the community survey must be independent (separate) from the sample of children and families who compose the main study participants to prevent a confounding of neighborhood dimensions with individual-level indicators that are also assessed by means of participant ratings. The second approach, systematic social observation, has several techniques for data collection ranging from videotaping to rater checklists and audiotaping. These methods are just coming on line, but initial evidence suggests they may be particularly useful for assessing social organizational features of neighborhoods discussed under norms/collective efficacy models (Perkins & Taylor, 1996; Raudenbush & Sampson, in press; Spencer, McDermott, et al., 1997). This is not to suggest that these techniques cannot be used to explore other theoretical models (institutional resources and relationships). In sum, these alternative approaches provide a means for testing the theoretical models for understanding the processes through which neighborhoods exert influence on children and families. These techniques are most useful when used in conjunction with census data to see if the processes under investigation play a role over and above (or in interaction with) neighborhood structural dimensions as assessed by census data. The work by Sampson et al. (1997) on

collective efficacy is an exemplar of this strategy. Conducting a community survey can be expensive, but researchers are unlikely to tap dimensions such as collective efficacy unless a community survey is conducted. For systematic social observation, audiotaping may be the most economical and unbiased means of obtaining process data.

What Processes Are the Most Important Pathways Through Which Neighborhoods May Influence Child Development?

Although our identification of the mechanisms through which neighborhood effects may operate on development has drawn heavily from Jencks and Mayer's (1990) framework, we have attempted to reformulate the models of neighborhood influences on the basis of the existing quantitative and qualitative studies that followed the publication of their article. Additionally, our framework has been developed to aid theoretical inquiries and empirical explorations of neighborhood mechanisms in part by specifying the different levels (individual, family, school, peer, community) at which such processes may operate and in part by consolidating overlapping models. Accordingly, we have identified three potential mechanisms through which neighborhood effects may be transmitted to children and adolescents—institutional resources, relationships, and norms/collective efficacy. Although the existing literature on indirect neighborhood effects is scant, we have found growing evidence for the role of relationships and norms/collective efficacy, especially the role of peers and informal social control. Our intention, however, has been to inform the next generation of neighborhood studies. To advance the understanding of neighborhood effects, researchers must combine family and individual process data that are typically collected in regional and city-based studies with valid and reliable neighborhood measures that are usually available in national data sets or neighborhood-based studies.

Next, we use our models of neighborhood influences to inform our examination of the findings on direct neighborhood effects more closely. Specifically, for school readiness and achievement, the importance of high SES/affluence, particularly for European Americans, was clear for both children and youth. During adolescence, however, boys may be more sensitive to the presence of neighborhood resources than are girls. Affluent neighborhoods may have more institutional resources that are conducive to child and adolescent well-being, such as learning, social, and recreational activities and quality child care and schools. The presence of affluent neighbors also may influence family relationships, in particular, parenting practices within the home, such as the provision of learning experiences and structure and routines, that promote academic achievement. There were some empirical data to support this premise. Racial differences are most interpretable under institutional resource models. Even when African American children and youth reside in affluent neighborhoods, these neighborhoods may lack adequate resources or may have lower quality resources than those available to their European American peers in affluent neighborhoods. In terms of gender differences among adolescents, several researchers have suggested that parents, as well as schools, may treat girls and boys differently during adolescence (Ensminger et al., 1996; Entwisle et al., 1994). Such findings would implicate family relationships—particularly de-

creased parental supervision and monitoring of boys during adolescence relative to girls, which, in turn, results in increased exposure to neighborhood resources for boys—as another potential mechanism through which neighborhood SES effects operate. Alternatively, under institutional resource models, adolescents' expectations and aspirations about future employment opportunities available to them are another potential mechanism through which neighborhood affluence effects may be transmitted. Adolescent boys may think that they have more options than adolescent females, especially if positive role models in their neighborhoods are predominantly men.

For both children and adolescents, residing in a low-SES neighborhood had an adverse effect on behavioral and emotional well-being, especially externalizing behavior problems among young children and delinquency and problem behavior among adolescents. Such effects could be interpreted under the norms/collective efficacy framework. Specifically, poor communities may lack informal control and, consequently, the ability to regulate the behavior of children and youth. Further, in such communities, institutions may not be present to supervise, monitor, and protect children and adolescents. Our review of the social disorganization research under models of norms/collective efficacy supports this hypothesis regarding the importance of informal social control and supervision of peer activities for curtailing adolescent delinquency.

Among adolescents, neighborhood employment indicators were most commonly associated with sexuality and childbearing. The findings for neighborhood unemployment could be interpreted under institutional resource models and adolescents' expectations and aspirations about the opportunities available to them based on peers', parents', and neighbors' experiences. The effect of neighborhood employment, on the other hand, could be interpreted under norms/collective efficacy and relationship frames in terms of decreased community and parental monitoring and supervision of youth.

In general, much more theoretically linked work is needed. Separating neighborhood income into affluence and poverty is an example of such work (Brooks-Gunn et al., 1993). Additional examples include research by Sampson et al. (1997) and others on social disorganization and by Wilson (1997) on concentrated disadvantage. Research without such conceptual underpinnings leads to confusion and often to contradictory findings. For instance, an example of research with questionable theoretical merit is work on childhood examining neighborhood effects separately for boys and for girls.

What Are the Strength of Effects for Neighborhood Processes?

Because of the scarcity of research in this area, we cannot say much. Informal social control/regulation mediated about 50% of the effect of residential instability on community rates of delinquency, even after controlling for prior crime rates (Sampson, 1997). A similar effect size for informal social control was reported for mediated effects of neighborhood social disadvantage (combined measure of poverty, mobility, single-parent families, and ethnic density) on community rates of youths' nondelinquent activities (Elliott et al., 1996). These results provide the best evidence of pathways through which neighborhood residence might influence children and youth. Among younger children,

Klebanov et al. (1997) found that family process variables, in particular, the quality of the home learning environment, mediated the effect of neighborhood high SES and ethnic diversity on children's verbal ability, reading achievement, and internalizing behavior problem scores (reduced ratio of unstandardized coefficient to standard error from approximately 3 to 2 for ethnic diversity and reduced this ratio from approximately 2 to 1 for high SES). Together, these findings suggest that neighborhood effects are largely mediated through community- and family-level processes, but clearly, more work needs to be done in this area.

Does the Effectiveness of Different Family Strategies Depend on the Context in Which Families Are Embedded?

The findings of qualitative and quantitative research indicate that different parenting strategies may be differentially efficacious depending on the neighborhoods in which families live (Briggs, 1997b; Furstenberg, 1993; Jarrett, 1997). The effectiveness of these different strategies, which range from highly restrictive and isolating practices to resource-seeking strategies in the local and extralocal community, is also likely to vary depending on the age of the child, but little research exists to test this premise. Moreover, much of the research examining family-context interactions has not included a range of family types or a range of neighborhood types but has focused on predominantly poor, African American families residing in poor neighborhoods. In general, it is difficult to address this issue without considering the profound racial differences in family and neighborhood circumstances. European American children are more than 6 times as likely as African American children to reside in an affluent neighborhood (less than 10% of residents poor), and conversely, African American children are approximately 10 times more likely than European American children to live in a poor neighborhood (30% or more of residents poor; Duncan et al., 1994). Moreover, the majority of European American children, in contrast to 1 in 20 African American children, escape poverty at both the familial and neighborhood levels (Brooks-Gunn, Klebanov, & Duncan, 1996). These striking discrepancies exact a toll on the ability of parents to manage their children's lives, as well as on the consequences of these strategies for their children. African American parents may be less able to rely on their communities for assistance and resources in raising their children than are European American families (Elder et al., 1995), and African American children residing in poor neighborhoods may be less likely to benefit developmentally from enriching home environments (Klebanov et al., 1997). These findings clearly suggest that, given the marked demographic discrepancies in the lives of African American and European American families with children, researchers need to consider moderator or subgroup analyses when examining racially diverse groups of children.

What Are the Biggest Confounds to Neighborhood Research?

Three confounds must be taken into account when conducting neighborhood research. First, in studying context, an important issue is the simultaneity problem, as addressed by transactional models of human development. Interactions between children and

families are bidirectional in nature (Sameroff & Chandler, 1975). Those between families and neighborhoods may be as well. For example, assuming here that peers are a mechanism of neighborhood influences, an adolescent's behavior is shaped by his or her peers, but the adolescent also influences the behavior of his or her peers. Empirically, it is difficult to estimate these exogenous and endogenous social interactions (Duncan & Raudenbush, 1999).

The second and more familiar problem is omitted context variables. In other words, do researchers have the correct measures of neighborhoods? If not, estimates of neighborhood effects will be biased. When neighborhood research is limited to census data, researchers must consider not only which structural dimensions of neighborhoods are most salient but also what important neighborhood dimensions not assessed by the census are missing. A community survey and systematic social observation can get at other aspects of neighborhoods, such as networks, social control, and the like. The use of administrative data sources, such as crime rates, school quality, number of police in the area, and child health status, tap yet other dimensions that may address omitted context variables. At the very least, the decision about what neighborhood dimensions to include in a study depends on the issues being investigated, data availability, cost, and sample size.

The final confound is the problem of endogeneity (or selection). Specifically, neighborhood residence is not random; rather, families choose to live in a neighborhood. Thus, there may be individual-level variables that are important but that may be omitted or unmeasured. It is possible that neighborhood effects are overestimated because families who do not move from a poor neighborhood may be different in ways that inflate neighborhood effects from families who choose to move. For example, families who do not move may have mothers who are more depressed and have less social support than families who move. Alternatively, it is possible that neighborhood effects are underestimated because families who do not move from poor neighborhoods differ from families who move in ways that suppress neighborhood effects. For example, parents who stay in poor neighborhoods may do so to reduce their commuting time so that they have more time to spend with their children, or they may stay because rents are cheaper and the additional funds can be used to pay for private schools or other activities for their children. It is not clear which scenario, if either, is more accurate (except by means of studies with longitudinal experimental designs).

We recommend several strategies for addressing these confounds. The problem of transactional effects or simultaneity is difficult to confront. In the case of some neighborhood dimensions, such as structural characteristics, it may be possible to use an instrumental variable approach if some determinant of the neighborhood dimension that is not a determinant of the behavior under investigation can be found. At the neighborhood level, including better measures of context, such as crime rates and social control, can also improve estimates of neighborhood effects (Elliott et al., 1996; Sampson et al., 1997). Studies that are guided by a theoretical framework are more likely to fall into this category. Including better measures of individual and family characteristics that are likely to be associated with neighborhood residence, such as social support, depression, and efficacy, can reduce omitted variable biases at the individual level (Duncan et al., 1997). Sibling analyses, which hold constant unmeasured family characteristics, and behavioral genetic models, which account for genetic liability

shared by parents and offspring, can also be used to address this problem.

What Are the Implications of Neighborhood Research for Intervention?

We hope that this review, building on the existing literature, will lead to better designs of neighborhood research in the growing field of community intervention research. As yet, few community-based interventions have used the conceptual approaches of neighborhood research (see Rossi, in press, for a review of community interventions). Nor have these programs been child or family focused (Brown & Richman, 1997). However, what appears to be clear from neighborhood research and program evaluations is that grass-roots programs alone, which attempt to strengthen support networks, are unlikely to make a difference (Sampson, in press; Skogan, 1990). As models of norms/collective efficacy indicate, such relations among neighbors remain limited at best. On the contrary, more promising community interventions entail providing neighborhoods with important foundations that are often lacking—resources, stability, and safety—through both individual and joint public and private efforts. Examples of private efforts are destruction or rehabilitation of abandoned housing; public efforts include enforcement of truancy and loitering laws; community policing, which entails a collaboration between police and communities to reduce crime and improve safety, is a joint public and private effort. Additional theoretical work is needed to inform these programs (Leventhal, Brooks-Gunn, & Kamerman, 1997). Finally, in light of the recent devolution, services for children and families are increasingly being offered at the local level. Well-specified and thoughtful neighborhood research can enhance these policies and programs.

Summary

In summary, because of the confounds inherent in neighborhood research, we recommend several designs. First, experimental or quasi-experimental designs provide the best test of neighborhood effects by minimizing selection as a problem. Neighborhood sampling with data from the census is also recommended, but such studies can be expensive because a sufficient number of neighborhoods, as well as a sufficient number of participants per neighborhood, must be sampled. Research reliant on national data must include individual- or family-level variables in analyses of neighborhood influences in order to reduce mis-specification of neighborhood effects. National and multisite studies are also amenable to statistical approaches, such as sibling studies and instrumental variable approaches, which minimize the importance of unmeasured family and neighborhood characteristics. Addressing the pathways through which neighborhood effects may operate on children and youth is the next step in neighborhood research. This task involves moving beyond census data to administrative data sources, community surveys, and systematic social observation. Finally, the research to date has focused on neighborhoods as social addresses that are quite static, similar to the social address of SES of a family, neglecting the fact that neighborhoods change. Moreover, families move across neighborhoods, and, with age, children and youth have multiple neighborhoods of influence. The next generation of researchers needs to incorporate models of

change into its data collection procedures, theoretical frameworks, and analytic strategies.

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