Annu. Rev. Sociol. 2002. 28:443–78
doi: 10.1146/annurev.soc.28.110601.141114

ASSESSING "NEIGHBORHOOD EFFECTS": Social Processes and New Directions in Research

Robert J. Sampson,[1] Jeffrey D. Morenoff,[2] and Thomas Gannon-Rowley[1]

[1]*Department of Sociology, University of Chicago, Chicago, Illinois 60637; e-mail: rjsam@src.uchicago.edu, tpgannon@uchicago.edu*

[2]*Department of Sociology, University of Michigan, Ann Arbor, Michigan 48106; e-mail: morenoff@isr.umich.edu*

Key Words neighborhood effects, ecology, problem behavior, social processes, mechanisms

■ **Abstract** This paper assesses and synthesizes the cumulative results of a new "neighborhood-effects" literature that examines social processes related to problem behaviors and health-related outcomes. Our review identified over 40 relevant studies published in peer-reviewed journals from the mid-1990s to 2001, the take-off point for an increasing level of interest in neighborhood effects. Moving beyond traditional characteristics such as concentrated poverty, we evaluate the salience of social-interactional and institutional mechanisms hypothesized to account for neighborhood-level variations in a variety of phenomena (e.g., delinquency, violence, depression, high-risk behavior), especially among adolescents. We highlight neighborhood ties, social control, mutual trust, institutional resources, disorder, and routine activity patterns. We also discuss a set of thorny methodological problems that plague the study of neighborhood effects, with special attention to selection bias. We conclude with promising strategies and directions for future research, including experimental designs, taking spatial and temporal dynamics seriously, systematic observational approaches, and benchmark data on neighborhood social processes.

INTRODUCTION

At the outset of the 1990s, Jencks & Mayer (1990, Mayer & Jencks 1989) argued that if growing up in a poor neighborhood mattered, intervening processes such as collective socialization, peer-group influence, and institutional capacity were presumably part of the reason. Their influential assessment of the so-called neighborhood-effects literature was ultimately pessimistic, however, for few studies could be found that measured and identified social processes or mechanisms. A major reason is that the data sources traditionally relied upon by neighborhood researchers—the U.S. Census and other government statistics—typically provide

information on the sociodemographic composition of statistical areas (e.g., the poverty rate or racial makeup of census tracts) rather than the dynamic processes hypothesized to shape child and adolescent well-being. Then and now, Jencks & Mayer's critique was formidable.

The good news is that the decade since their review marked a period of major advances in neighborhood-level research, as researchers began to explore new methods and ideas for understanding what makes places more or less healthy, particularly for young people. A large number of studies were also launched in a short period, so many that the study of neighborhood effects, for better or worse, has become something of a cottage industry in the social sciences. Figure 1 documents this striking trend. After spurts in the 1960s and 1970s followed by a decline, the mid 1990s to the year 2000 saw more than a doubling of neighborhood studies to the level of about 100 papers per year. The bad news is that this recent spurt in quantity has not been equally matched in quality; much hard work remains to be done.

The purpose of this paper is to synthesize the results of the recent generation of neighborhood studies that focus on social and institutional processes, especially as related to problem behavior among young people. We begin with a brief overview of two longstanding concerns—how researchers typically define local communities (what is a neighborhood?) and the persistent patterns that link problem- and health-related behaviors with concentrated poverty and other indicators of residential differentiation. The heart of our assessment then turns to advances in the

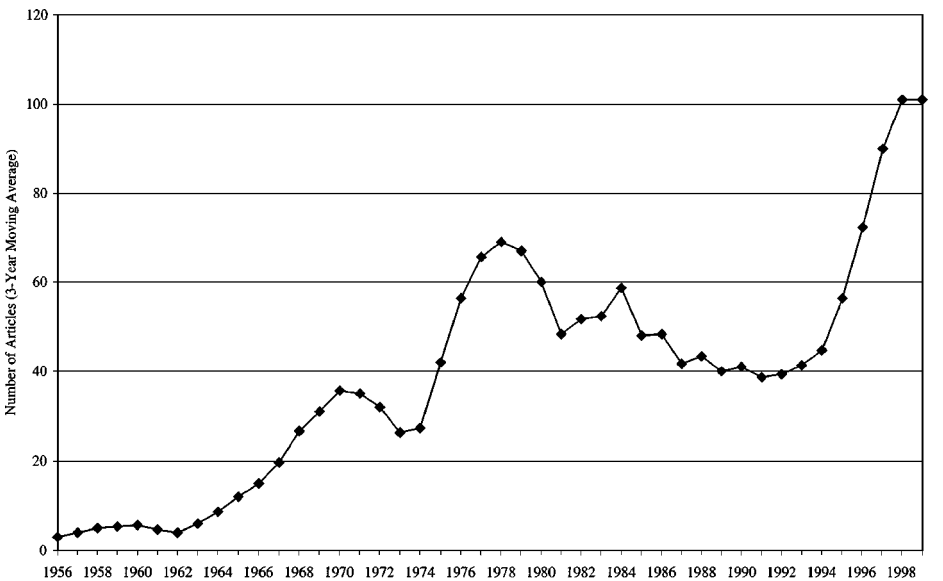

Figure 1 Articles with "Neighborhood" and "Social Capital" in title: Social Citation Index.

measurement of neighborhood social and institutional processes. Our review covers research in the second half of the 1990s, the take-off point for an increasing level of activity (Figure 1). We also evaluate a set of thorny methodological problems that plague the study of neighborhood effects, the most notable being selection bias. We conclude with strategies to address these challenges and promising directions for future research, including experimental designs, spatial and temporal models, systematic observational approaches, and collecting benchmark survey data on neighborhood social processes.

DEFINING NEIGHBORHOOD

Robert Park and Ernest Burgess laid the foundation for urban sociology by defining local communities as "natural areas" that developed as a result of competition between businesses for land use and between population groups for affordable housing. A neighborhood, according to this view, is a subsection of a larger community—a collection of both people and institutions occupying a spatially defined area influenced by ecological, cultural, and sometimes political forces (Park 1916, pp. 147–154). Suttles (1972) later refined this view by recognizing that local communities do not form their identities only as the result of free-market competition. Instead, some communities have their identity and boundaries imposed on them by outsiders. Suttles also argued that the local community is best thought of not as a single entity, but rather as a hierarchy of progressively more inclusive residential groupings. In this sense, we can think of neighborhoods as ecological units nested within successively larger communities.

In practice, most social scientists and virtually all studies of neighborhoods we assess rely on geographic boundaries defined by the Census Bureau or other administrative agencies (e.g., school districts, police districts). Although administratively defined units such as census tracts and block groups are reasonably consistent with the notion of overlapping and nested ecological structures, they offer imperfect operational definitions of neighborhoods for research and policy. As we discuss later, researchers have thus become increasingly interested in strategies to define neighborhoods that respect the logic of street patterns and the social networks of neighbor interactions (e.g., Grannis 1998).

NEIGHBORHOOD DIFFERENTIATION

Building on a long history of sociological research on urban communities, the study of neighborhood effects has generated a multidisciplinary research agenda with a strong focus on child and adolescent development. Spurred in large part by Wilson's (1987) seminal book, *The Truly Disadvantaged*, modern neighborhood research has attended primarily to structural dimensions of neighborhood disadvantage, especially the geographic isolation of poor, African-American, and

single-parent families with children (Small & Newman 2001). The range of child and adolescent outcomes associated with concentrated disadvantage is quite wide and includes infant mortality, low birthweight, teenage childbearing, dropping out of high school, child maltreatment, and adolescent delinquency (for an overview, see Brooks-Gunn et al. 1997a,b). There is also independent evidence that a number of health-related indicators cluster spatially, including homicide, infant mortality, low birthweight, accidental injury, and suicide (Almgren et al. 1998, Sampson 2001). The weight of evidence thus suggests that there are geographic "hot spots" for crime and problem-related behaviors and that such hot spots are characterized by the concentration of multiple forms of disadvantage.

To a lesser extent, the social-ecological literature has considered aspects of neighborhood differentiation other than concentrated disadvantage, including life-cycle status, residential stability, home ownership, density, and ethnic heterogeneity. The evidence on these factors is decidedly more mixed, especially for population density and ethnic heterogeneity (Brooks-Gunn et al. 1997a,b, Morenoff et al. 2001). Perhaps the most extensive area of inquiry after disadvantage, dating back to the early Chicago School, concerns residential stability and home ownership. Although the evidence here is also mixed (e.g., Ross et al. 2000), residential instability and low rates of home ownership are durable correlates of many problem behaviors (Brooks-Gunn et al. 1997a,b). A more recent but understudied object of inquiry is concentrated affluence (Massey 1996). Brooks-Gunn et al. (1993) argue that it is the positive influence of concentrated socioeconomic resources, rather than the presence of low-income neighbors, that matters most for adolescent behaviors. The common tactic of focusing on concentrated disadvantage may thus obscure the potential protective effects of affluent neighborhoods.

In short, empirical research on social-ecological differentiation has established a reasonably consistent set of neighborhood facts relevant to children and adolescents.

- First, there is considerable social inequality among neighborhoods in terms of socioeconomic and racial segregation. There is strong evidence on the connection of concentrated disadvantage with the geographic isolation of African Americans.
- Second, a number of social problems tend to come bundled together at the neighborhood level, including, but not limited to, crime, adolescent delinquency, social and physical disorder, low birthweight, infant mortality, school dropout, and child maltreatment.
- Third, these two sets of clusters are themselves related—neighborhood predictors common to many child and adolescent outcomes include the concentration of poverty, racial isolation, single-parent families, and rates of home ownership and length of tenure.
- Fourth, empirical results have not varied much with the operational unit of analysis. The place stratification of local communities in American society by factors such as social class, race, and family status is a robust phenomenon

that emerges at multiple levels of geography, whether local community areas, census tracts, or other neighborhood units.

- Fifth, the ecological concentration of poverty appears to have increased significantly during recent decades, as has the concentration of affluence at the upper end of the income scale.

Neighborhoods and residential differentiation thus remain persistent in American society. As real estate agents and homeowners (especially those with children) often declare, location seems to matter. The next logical questions are: Why does neighborhood matter, for what, and to what degree? The cumulative facts on neighborhood differentiation yield a potentially important clue in thinking about these questions. If numerous and seemingly disparate outcomes are linked together empirically across neighborhoods and are predicted by similar structural characteristics, there may be common underlying causes. We thus assess this possibility, along with alternative interpretations that question the existence of neighborhood effects altogether.

BEYOND POVERTY: SOCIAL PROCESSES AND MECHANISMS

During the 1990s, a number of scholars moved beyond the traditional fixation on concentrated poverty and began to explicitly theorize and directly measure how neighborhood social processes bear on the well-being of children and adolescents. Unlike the more static features of sociodemographic composition (e.g., race, class position), social processes or mechanisms provide accounts of *how* neighborhoods bring about a change in a given phenomenon of interest (Sorensen 1998, p. 240). Although concern with neighborhood mechanisms goes back at least to the early Chicago School of sociology, only recently have we witnessed a concerted attempt to theorize and empirically measure the social-interactional and institutional dimensions that might explain how neighborhood effects are transmitted.

This review focuses on the resulting turn to social processes in neighborhood-effects research. We performed a systematic search for studies that investigated variations in some aspect of social processes or mechanisms across ecologically defined units of analysis (e.g., census tracts, block groups).[1] We limited our review to quantitative studies published in peer-reviewed social or behavioral science journals beginning in the latter half of the 1990s (1996) and running through summer 2001. This period maps onto the upswing in action seen in Figure 1 and

[1]Given this framing, we did not attempt to evaluate the school-effects literature. Although the connection of schools and neighborhoods is clearly important (Jencks & Mayer 1990) and considerable progress has been made in recent research (e.g., Welsh et al. 1999), space limitations precluded our taking on the nexus of school and neighborhood social processes.

follows in sequence the research epoch covered in Gephardt's (1997) review.[2] Initially, we decided to limit our focus to problem-related or health-compromising behaviors among children and adolescents, such as delinquency, dropping out of high school, and teen childbirth.[3] In conducting our review, however, we found very few neighborhood-effects studies that restricted their attention solely to children or adolescents. Moreover, this criterion excluded many studies that shed new light on neighborhood social mechanisms. We thus highlight studies of child and adolescent development, wherever possible, but cast a wider net in order to capture studies of problem- and health-related outcomes that cover a variety of ages (e.g., rates of crime, adult depression), as long as they examine some dimension of neighborhood or intervening social processes.[4]

We organize our assessment by implementing a classification based on research design and level of analysis. We included studies in our review that fit any of the three following categories: (*a*) neighborhood-level studies with neighborhood process measures, in which both the dependent and independent variables are expressed as aggregate scales, counts, or rates across ecologically defined areas that are akin to neighborhoods; (*b*) multilevel studies with neighborhood process measures, in which sample members are nested within ecologically defined neighborhoods, the dependent variable is measured at the individual level, and the independent variables include both individual-level factors and aggregate-level measures of neighborhood characteristics (both structure and process); and (*c*) multilevel studies with pseudo or proxy neighborhood-process measures, identical to the previous category except that social processes are actually measured at the individual level. Although studies in the third category usually make inferences about neighborhood-level variations, they only marginally fulfill our selection criteria because analytically they treat social processes as individual-level

[2]We encourage readers to consult independent reviews with different foci. For example, Gephardt (1997) emphasizes the role of structural characteristics such as concentrated poverty. Burton & Jarrett (2000) examine family processes in neighborhood-based studies of child development, with a specific focus on minority populations. Duncan & Raudenbush (1999) and Sobel (2001) outline mainly methodological issues and research strategies in neighborhood-level studies of child and youth development. Robert (1999) reviews the relationship between community socioeconomic context and various health outcomes (including physical), while Leventhal & Brooks-Gunn (2000) and Earls & Carlson (2001) focus primarily on young children, families, and neighborhoods. Finally, we do not attempt to cover a burgeoning ethnographic or qualitative literature in any detail, or corresponding cultural accounts of neighborhood effects. For a recent effort along these lines, see Small & Newman (2001).

[3]Although we appreciate criticisms of the somewhat arbitrary designations of what are deemed "non-normative" or "problem" behaviors, we follow the spirit of the reviewed authors by including behaviors such as teenage premarital childbirth and age of onset of first sex.

[4]Although outside our initial selection criteria, we also included studies that focus on family or peer-group intervening processes (e.g., South & Baumer 2000) because of their theoretical relevance to understanding neighborhood effects (see Jencks & Mayer 1990).

characteristics rather than as emergent properties of neighborhoods. For example, this category would include a neighborhood social process measure derived from a single individual's report of his or her neighborhood (e.g., Aneshensel & Sucoff 1996, Geis & Ross 1998), even though such a strategy may yield an unreliable neighborhood-level measure with considerable measurement error.[5] On theoretical grounds we nonetheless include such studies in our review, but only if they analyze data where individuals are nested within ecologically defined neighborhoods and structural characteristics (e.g., poverty) are expressed as aggregate-level measures.

Taking Stock: Summary of Results

In Tables 1–3 we summarize the major findings from 40 studies that met our selection criteria, ordered according to our three-fold classification scheme—neighborhood-level (Table 1, N = 15 studies), multilevel (Table 2, N = 8), and individual-level measures of social processes (Table 3, N = 17). We refer the reader to these tables for the relevant details of each study (e.g., unit of analysis, measures, key results); our focus from here on out is thematic synthesis across the range of studies.[6] Our assessment leads us to the following synthesis.

- *Advances in Research Design and Measurement*. One of the most important first-order findings from recent research is that community-based surveys can yield reliable and valid measures of neighborhood social and institutional processes. However, unlike individual-level measurements, which are backed up by decades of psychometric research into their statistical properties, the methodology needed to evaluate neighborhood measures is not widespread. Raudenbush & Sampson (1999) thus proposed moving toward a science of ecological assessment, which they call "ecometrics," by developing systematic procedures for directly measuring neighborhood mechanisms, and by integrating and adapting tools from psychometrics to improve the quality of neighborhood-level measures. Leaving aside statistical details, the important point is that neighborhood processes can and should be treated as ecological

[5]An alternative approach, found in the neighborhood-level and multilevel process studies (categories *a* and *b*) is to survey multiple respondents living in the same ecological areas and use their collective assessment to build neighborhood indicators (e.g., Elliott et al. 1996, Cook et al. 1997, Sampson et al. 1997). Other strategies, described below, include standardized observational assessments. See footnote 7 for further justification regarding this classification.

[6]In each table we report findings primarily as they relate to neighborhood process measures and outcomes. We try to maintain fidelity to each study's interpretations or interests, but often they diverge from the present paper's focus. All findings reported were deemed significant by study authors unless otherwise noted. Also, in order to standardize reporting of findings, "full(y)" and "partial(ly)" mediation refer to a significant direct effect being reduced to nonsignificance (NS) or to significant but substantially reduced levels, respectively.

TABLE 1 Neighborhood-level studies of social processes and mechanisms, 1996–2001

Author(s)	Data sources and sample	Neighborhood units of analysis	Process (P) and Outcome (O) measures	Main findings
Warner & Rountree (1997)	Seattle Victim Survey (N = 5,302), Seattle police, 1990 Census	Tracts (N = 100)	P: local social ties O: burglary, assault	■ ties → (+) burglary ■ stability → (−) assault, fully mediated by ties but only in average poverty level tracts ■ ties → (−) assault, but only in predominantly white tracts
Rountree & Warner (1999)	Same as above	Same as above	P: male, female social ties O: violent crime	■ female ties → (−) violence, but only in tracts with low levels of female households ■ stability → (−) violence, partially mediated by male ties, female ties ■ male ties → (NS) violence
Bellair (1997)	Police Services Study (N = 12,019): Rochester, St. Louis, Tampa/St. Petersburg	Police beats (N = 100)	P: measures of social interaction (10) O: burglary, vehicle theft, robbery, property crime index, total crime index	■ infrequent interaction (i.e., once a year or more) → (−) burglary, theft, robbery ■ infrequent interaction: most powerful predictor overall, strongest mediator of structural effects on total crime ■ structural effects persist, but social interaction fully or partially mediates at least one structural effect per outcome
Bellair (2000)	Seattle Victim Survey (N = 5,302) Seattle police, 1990 Census	Tracts (N = 100)	P: informal surveillance, unsupervised teens, neighboring O: robbery/stranger assault (R/SA), burglary	■ surveillance → (−) R/SA, (NS) burglary ■ teens → (+) R/SA, burglary Reciprocal Effects Models ■ model 1: R/SA→ (−) surveillance . . . surveillance → (NS) R/SA when controlling effect of R/SA on surveillance ■ model 2: surveillance → (−) R/SA . . . R/SA→ (+) risk perception . . . risk perception → (−) surveillance

				■ fear does not mediate the effect of R/SA on surveillance, but risk perception does ■ model 3: R/SA → (−) surveillance becomes stronger when controlling burglary; burglary → (+) surveillance when controlling R/SA
Sampson (1997)	Chicago Community Survey (N = 3,864), 1990 Census	Neighborhood clusters (N = 80)	P: informal (child) social control O: delinquency (gang fights, graffiti, causing trouble in groups)	■ social control → (−) delinquency, even when controlling for prior crime, structure ■ stability → (−) delinquency, but fully mediated by social control
Morenoff et al. (2001)	Chicago Community Survey (N = 8,782), Chicago police, vital statistics, 1990 Census	Neighborhood clusters (N = 343)	P: collective efficacy (CE), organizations, voluntary associations, kin/friendship ties O: homicide	■ inequality, CE → (−) homicide, controlling for prior homicide and spatial proximity (but effect of CE partially mediated by prior homicide) ■ spatial proximity → (+) homicide ■ other process measures → (NS) homicide
Sampson & Raudenbush (1999)	Chicago Community Survey (N = 3,864), systematic observations, Chicago police, 1990 Census	Tracts (N = 196)	P: collective efficacy (CE), observed disorder O: burglary, homicide, robbery, victimization	■ CE → (−) observed disorder, even after controlling for perceived disorder ■ CE → (−) observed disorder, all four crime outcomes ■ observed disorder → (+) violent victimization, but mediated by CE, structural variables ■ observed disorder → (+) robbery ■ disorder does not mediate the effect of CE or structural measures on homicide, burglary Reciprocal Effects Model ■ CE is a stronger predictor of crime than observed disorder, even when controlling reciprocal effects of crime on CE

(*Continued*)

TABLE 1 (*Continued*)

Author(s)	Data sources and sample	Neighborhood units of analysis	Process (P) and Outcome (O) measures	Main findings
Markowitz et al. (2001)	British Crime Survey (3 waves): N = 11,030, N = 11,741, N = 10,059	Political constituencies (N = 151)	P: disorder, cohesion, fear O: burglary, victimization	■ cohesion → (−) burglary; cohesion mediates some structural effects on burglary ■ disorder → (+) burglary, fully mediated by structure, cohesion, and prior levels of burglary Reciprocal Effects Models ■ model 1: cohesion → (−) burglary ■ model 2: cohesion → (−) disorder . . . disorder → (+) fear . . . fear → (−) cohesion ■ model 3: burglary → (−) robbery . . . robbery → (+) fear . . . fear → (−) cohesion
Peterson et al. (2000)	Columbus police, FBI Uniform Crime Reports, various public records/ local sources, 1990 Census	Tracts (N = 177)	P: neighborhood institutions (4) O: violent crime (robbery, assault, homicide, rape)	■ extreme economic deprivation → (+) violent crime, partially mediated by bars, recreation centers ■ bars → (+) crime ■ recreation centers → (−) crime but only in extreme economic deprivation areas
Veysey & Messner (1999)	British Crime Survey N = 10,905	Political constituencies (N = 238)	P: networks, unsupervised peer groups, organization participation O: victimization	■ peer groups → (+) victimization ■ org. participation, networks → (−) victimization ■ SES has large indirect effect on victimization, through organization participation and peers
Hirschfield & Bowers (1997)	Merseyside (Eng.) police/govt., British Consumer Survey, 1991 Census (N = 150–200 households/unit)	Enumeration districts (N = 2,800)	P: social cohesion (police calls, Homewatch organizations) O: assault, robbery, sexual offences, burglary	■ social control → (−) assault, robbery

Smith et al. (2000)	Police, local sources (mid-size southern city), 1990 Census	Face blocks (N = 7,931)	P: several routine activity (RA) measures: "land use" measures (e.g., motels, bars); guardianship (i.e., owner occupied) O: street robbery	■ "land use" variables → (+) robbery ■ owner occupied → (−) robbery 2SLS Models (modeling "diffusion" or potential) ■ "land use" finding holds when controlling diffusion ■ guardianship → (−) robbery, partially mediated by positive effect of diffusion ■ RA measures and social disorganization affect robbery, but disorganization affects robbery through the process of diffusion ■ evidence found for interactions of structural disorganization and land use
LaGrange (1999)	Edmonton Police/ Transit/Park Department	Enumeration areas (N = 654)	P: proximity to schools, malls O: mischief, vandalism (park, transit)	■ proximity to mall, public high school → (+) mischief, vandalism ■ mall → (+) mischief; public high school → (+) transit vandalism; Catholic high school → (+) park vandalism
Scribner et al. (1998)	New Orleans public health records/local sources,1994 Census	Tracts (N = 155)	P: routine activity measures (alcohol outlets) O: sexual risk behavior (i.e., gonorrhea)	■ alcohol density → (+) gonorrhea, whether outlets for "on-site" or "off-site" consumption
Cohen et al. (2000)	New Orleans public health records/local sources, systematic observations, 1990 Census	Block groups (N = 55)	P: neighborhood disorder O: same as above	■ disorder → (+) gonorrhea ■ poverty → (+) gonorrhea, but fully mediated by disorder

TABLE 2 Multi-level studies of social processes and mechanisms, 1996–2001

Author(s)	Data sources and sample	Neighborhood units of analysis	Process (P) and Outcome (O) measures	Main findings
Elliott et al. (1996)	Chicago (N = 887) and Denver (N = 820) survey of youth-caretaker pairs, 1990 Census	Chicago, tracts (N = 58) Denver, block groups (N = 33)	P: informal control, social integration, informal networks O: prosocial competence (PC), conventional friends (CF), problem behavior (PB)	Path Analysis Model ■ Chicago: integration → (+) PC, control → (−) PB ■ Denver: networks → (+) CF ■ Both sites: informal control → (+) PC, CF Neighborhood Level Analysis ■ Chicago: integration → (+) PC, (−) CF; control → (+) CF, (−) PB ■ Denver: control → (+) PC, CF; networks → (+) CF; networks → (−) PB
Sampson et al. (1997)	Chicago Community Survey (N = 8,872), 1990 Census	Neighborhood clusters (N = 343)	P: collective efficacy (CE) O: perceived violence, homicide events, victimization	Neighborhood Level Analysis ■ Model 1: CE → (−) all three outcomes ■ CE partially mediates some structural effects across models for each outcome ■ CE fully mediates: stability and disadvantage on victimization, immigrant concentration on perceived violence ■ Model 2: findings hold when controlling for prior homicide and when using homicide rates

Gorman-Smith et al. (2000)	Chicago Youth Development Study (N = 288, 11–14-year-old boys), archival sources, 1990 Census	Tract clusters (N = 275)	P: neighborliness, safety concerns O: delinquency: chronic minor, escalating, serious chronic, non-offenders	Clustering used to create neighborhood profiles based on neigh. structural and process measures ■ "structural risk" profile: higher overall levels of poverty, heterogeneity, disinvestment, violent crime ■ "social process risk" profile: low neighborliness, high safety concerns ■ structure risk, process risk → (+) chronic minor, escalating delinquency ■ neighborhood-family profile interactions not reported
Perkins & Taylor (1996)	Survey of Baltimore residents (N = 412), systematic observations, archival data, 1980 Census	Neighborhoods (N = 50)	P: perceived physical/social disorder, observed disorder O: fear of crime	Individual level: ■ Model 1, 2, 3: perceived social/physical disorder → (+) fear of crime Neighborhood level: (using 3 separate constructs of disorder, 2–3 measures per construct) ■ observed disorder (1 of 3) → (+) fear ■ perceived disorder (1 of 2) → (+) fear ■ perceived disorder, from news (1 of 2) → (+) fear
Steptoe & Feldman (2001)	Survey of London adults (N = 658), Census (year not reported)	Postal sectors (N = 37)	P: neighborhood problems, social cohesion, informal social control O: psychological distress	■ cohesion, informal control → (−) problems ■ neighborhood problems → (+) distress in low-SES areas only, controlling cohesion (NS) and informal control (NS) Neighborhood level: ■ neighborhood SES → (+) cohesion, (−) problems

(*Continued*)

TABLE 2 (*Continued*)

Author(s)	Data sources and sample	Neighborhood units of analysis	Process (P) and Outcome (O) measures	Main findings
Rountree & Land (1996)	Seattle Victim Survey (N = 5,090) Seattle police, 1990 Census	Neighborhoods (N = 300)	P: incivilities, integration, several routine activity measures (e.g. "exposure, target attractiveness, guardianship") O: fear of burglary	Individual level: ■ exposure, target attractiveness → (+) fear Neighborhood level: ■ incivilities, integration → (+) fear ■ exposure, target attractiveness, guard. → (+) fear ■ previous victimization → (+) fear, strongest in areas with low incivilities
Coulton et al. (1999)	Interviews of parents (N = 400), Child Services, 1990 Census	Block groups (N = 20)	P: social control (disorder, lack of control of children), community resources, social support O: child maltreatment	Individual level: ■ support → (−) maltreatment Neighborhood level: ■ control, resources → (NS) maltreatment
Cutrona et al. (2000)	Same as above (caregivers only, N = 709 women)	Same as above	P: community deviance, cohesion, disorder O: distress (general distress, anxiety)	Clustering used to create "disadvantage" measure Model 1: ■ disorder → (+) distress ■ social support → (−) distress ■ cohesion, disadvantage → (NS) distress Model 2: ■ disorder → (+) distress, strongest in high-disorder neighborhoods ■ cohesion → (−) distress, strongest in high-cohesion neighborhoods

or collective phenomena rather than as individual-level perceptions or traits. Again, we believe this distinction is crucial for the advancement of research.[7]

- *Disparate but Converging Measures of Neighborhood Mechanisms*. We found very little consistency across studies in Tables 1–3 in the way neighborhood social and institutional processes were operationalized or theoretically situated. Moreover, many indicators of neighborhood mechanisms are intercorrelated, raising the question of how many independent and valid constructs there really are (see also Cook et al. 1997, Furstenberg et al. 1999, Sampson et al. 1999). For example, is there only one higher-order social process, or are there multiple subdimensions? Sifting through the myriad operational definitions, empirical findings, and theoretical orientations represented in Tables 1–3, we believe that four classes of neighborhood mechanisms, although related, appear to have independent validity.

    1. Social Ties/Interaction: One of the driving forces behind much of the research on neighborhood mechanisms has been the concept of social capital, which is generally conceptualized as a resource that is realized through social relationships (Coleman 1988, Leventhal & Brooks-Gunn 2000). The studies we reviewed include measures that tap several dimensions of social relations, such as the level or density of social ties between neighbors (Rountree & Warner 1999, Elliott et al. 1996, Veysey & Messner 1999, Morenoff et al. 2001), the frequency of social interaction among neighbors (Bellair 1997), and patterns of neighboring (Warner & Rountree 1997, Bellair 2000).
    2. Norms and Collective Efficacy: Although social ties are important, the willingness of residents to intervene on behalf of children may depend, in larger part, on conditions of mutual trust and shared expectations among residents. One is unlikely to intervene in a neighborhood context where the rules are unclear and people mistrust or fear one another. It is the linkage of mutual trust and the shared willingness to intervene for the public good that captures the neighborhood context of what Sampson et al. (1997) term *collective efficacy*. Sampson and colleagues constructed a measure of collective efficacy by combining scales of the capacity for informal social control (see also Elliott et al. 1996, Steptoe & Feldman 2001) and social cohesion (see also Rountree &

[7]Raudenbush & Sampson (1999) demonstrate that individual-level reliabilities are fundamentally different and often very discrepant from, the aggregate-level reliability of a survey measure to detect *between-neighborhood* differences. The main factors increasing the aggregate reliability of a measure are the number of respondents within each neighborhood (with 25 a rule-of-thumb goal), the number of neighborhoods, and the proportion of total variance between neighborhoods relative to the amount within neighborhoods. Similarly, observational reliabilities depend on the number of ecological units assessed and the between-unit variance.

Land 1996, Markowitz et al. 2001). Other measures related to the idea of shared expectations for social control include informal surveillance or guardianship (Bellair 2000) and the monitoring of teenage peer groups (Veysey & Messner 1999, Bellair 2000).

3. Institutional Resources, at least in theory, refer to the quality, quantity, and diversity of institutions in the community that address the needs of youth, such as libraries, schools and other learning centers, child care, organized social and recreational activities, medical facilities, family support centers, and employment opportunities. In practice, however, empirical measures have been limited to the mere presence of neighborhood institutions based on survey reports (Coulton et al. 1999, Elliott et al. 1996) and archival records (Peterson et al. 2000). A few studies have used surveys to tap levels of participation in neighborhood organizations (Veysey & Messner 1999, Morenoff et al. 2001).[8]
4. Routine Activities: A concern for institutions suggests a fourth, often overlooked factor in discussions of neighborhood effects—how land use patterns and the ecological distributions of daily routine activities bear on children's well-being. The location of schools, the mix of residential with commercial land use (e.g., strip malls, bars), public transportation nodes, and large flows of nighttime visitors, for example, are relevant to organizing how and when children come into contact with peers, adults, and nonresident activity. Like studies of institutions, however, direct measures of social activity patterns are mostly absent. Studies of routine activities typically measure types of land use in the neighborhood, such as the presence of schools, stores and shopping malls, motels and hotels, vacant lots, bars, restaurants, gas stations, industrial units, and multifamily residential units (e.g., LaGrange 1999, Sampson & Raudenbush 1999, Smith et al. 2000, Peterson et al. 2000, Scribner et al. 1998).

- *Strongest Evidence Links Neighborhood Processes to Crime*. To date, most research on neighborhood interactional and institutional processes has focused on crime outcomes, especially police records of homicide, robbery, and stranger assault, and survey reports of violent and property victimization. This focus is not surprising given the influence of social disorganization theory in criminology, motivating research on crime rates and neighborhood mechanisms (Morenoff et al. 2001). The studies summarized in Tables 1 and 2 suggest that crime rates are related to neighborhood ties and patterns of interaction (Warner & Rountree 1997, Rountree & Warner 1999, Veysey & Messner 1999, Bellair 1997), social cohesion and informal social control (Elliott et al. 1996, Sampson et al. 1997, Hirschfield & Bowers 1997, Morenoff

[8]Most studies under review thus do not distinguish well between structural dimensions of institutions (e.g., their density) and mediating institutional processes.

et al. 2001, Bellair 2000), institutional resources (Veysey & Messner 1999, Peterson et al. 2000), and routine activity patterns, especially mixed land use and proximity to schools and malls (LaGrange 1999, Smith et al. 2000).

- *Activation of Social Ties*. There is evidence, however, suggesting that strong social ties may not be as critical for child well-being and general safety as the shared expectation that neighbors will intervene on behalf of the neighborhood. One can imagine situations where strong ties may impede efforts to establish social control, as when dense local ties foster the growth of gang-related networks (Pattillo-McCoy 1999). Moreover, weak ties—less intimate connections between people based on more infrequent social interaction—may be essential for establishing social resources such as job referrals because they integrate the community by bringing together otherwise disconnected subgroups (Granovetter 1973, Bellair 1997). Two general research findings support this line of thinking. First, some studies have shown that the association of ties with crime is largely mediated by informal social control and social cohesion (Elliott et al. 1996, Morenoff et al. 2001). Second, other studies have qualified the relationship between ties and crime by suggesting that crime is related only to certain patterns of neighborhood ties and social interaction, such as social ties among women (Rountree & Warner 1999) or moderate frequency of social interaction among neighbors (Bellair 1997). These findings suggest that the activation of social ties to achieve shared expectations for action, or what Sampson et al. (1997, 1999) propose is a general construct of collective efficacy, may be a critical ingredient for understanding neighborhood crime and general aspects of community well-being.
- *Social Mechanisms and Health*. In a related matter, a growing number of studies have expanded the scope of neighborhood inquiry to consider mental health outcomes such as depression and psychological distress (Ross 2000, Cutrona et al. 2000), and high-risk adolescent behaviors such as early sexual initiation, teen childbearing, and conduct disorder (e.g., Upchurch et al. 1999, South & Baumer 2000, Lanctot & Smith 2001). As Table 3 underscores, these studies overwhelmingly measure social processes at the individual rather than neighborhood level, making it difficult to offer a summary assessment of which, if any, neighborhood-level mechanisms are important. Overall, however, it appears that concentrated poverty, disorder, and low neighborhood cohesion are linked to greater mental distress (e.g., Ross 2000, Elliott 2000, Cutrona et al. 2000, Geis & Ross 1998, Aneshensel & Sucoff 1996), risk taking and deviant peer affiliation among adolescents (Brody et al. 2001, Kowaleski-Jones 2000, Lanctot & Smith 2001), and indicators of high-risk sex (Cohen et al. 2000, Baumer & South 2001). Some studies show that peer-group factors (e.g., deviant attitudes) mediate the effect of neighborhood disadvantage on teenage behaviors (e.g., South & Baumer 2000).

TABLE 3 Individual-level studies of social processes and mechanisms, 1996–2001

Author(s)	Data sources and sample	Neighborhood units	Process (P) and Outcome (O) measures	Main findings
Lanctot & Smith (2001)	Rochester Youth Development Study: survey of girl-caretaker pairs (N = 196 girls age 14–17); various local data sources	Tracts (N = 80)	P: neighborhood disorganization, "deviant influences": risky time with friends, gang member O: early sexual activity, pregnancy, status offenses, drug/alcohol use	■ disorganization → (+) early sexual activity ■ risky time with friends → (+) status offenses ■ gang member → (+) early sexual activity, drug/alcohol use
South & Baumer (2000)	National Survey of Children (N = 562 women), 1980 Census	Zip codes (N = 202)	P: peers' prochildbearing attitudes and behaviors, parents know child's friends O: first teenage premarital birth	Models: separate tests of intervening variables ■ peers' attitudes/behaviors → (+) first birth, fully mediating positive effect of disadvantage ■ own supportive attitude → (+) first birth, fully mediating positive effect of disadvantage ■ parent knows friends→ (−) first birth Final Model: peers/own attitudes, mobility ■ own attitude, mobility → (+) first birth ■ affluence → (−) first birth in all models
Baumer & South (2001)	same study as above (N = 1,111 young adults, age 18–22)	Zip codes (N = 278)	P: same as above O: sex activities: first premarital sex, frequency, # partners, unprotected sex	■ peers' attitudes/behaviors → (+) sexual activity, partially mediating the positive effect of disadvantage ■ parents know friends → (NS) sex activity ■ disadvantage → (+) frequency, unprotected sex; remains significant when simultaneously controlling all intervening variables

Ramirez-Valles et al. (1998)	Michigan survey of sexually active students (N = 370 adolescents), 1990 Census	Tracts (N not reported)	P: prosocial activities (i.e., school, church, community organizations) O: sex risk behavior (first sex, # partners, condom use)	■ prosocial activities → (−) sexual risk behavior ■ family SES, parent involvement → (−) sexual risk behavior, mediated by prosocial activities ■ neighborhood poverty → (+) sexual risk behavior, controlling for family measures, prosocial activities
Upchurch et al. (1999)	Los Angeles County survey (N = 870, age 12–17), 1990 Census	Tracts (N = 49)	P: perceived ambient hazards (AH) (e.g., threats, disorder, disintegration) O: first sex	Neighborhood cluster analysis: SES, race/ethn. ■ AH → (+) boys', girls' first sex ■ middle-class Black and Hispanic neighborhoods → (+) boys' first sex, but fully mediated by AH ■ working-class Black neighborhoods → (+) boys' first sex, but partially mediated by AH ■ "structural neighborhood" → (−) girls' first sex in underclass Black and Hispanic neighborhood, only after controlling AH
Aneshensel & Sucoff (1996)	same as above (N = 877)	same as above	P: social cohesion, AH (see above) O: emotional health: depression, anxiety, oppositional defiant disorder, conduct disorder	Clustering: same as above ■ cohesion → (−) depression ■ AH → (+) emotional health, weakest effect on depression

(*Continued*)

TABLE 3 (*Continued*)

Author(s)	Data sources and sample	Neighborhood units	Process (P) and Outcome (O) measures	Main findings
Stiffman et al. (1999)	Youth Services Project: St. Louis survey of adolescents (N = 792, age14–18), 1990 Census	Tracts (N not reported)	P: perceived neighborhood problems, peer influence, violence exposure O: mental health (6 indicators)	■ perceived problems → (−) mental health, increased by exposure to violence, decreased (or partially mediated) by supportive envt. ■ "objective environment" → (NS) mental health
Shumow et al. (1998)	Milwaukee survey (N = 168) (5th graders): student reports (SR), parent reports (PR), teacher reports (TR), 1990 Census	Tracts (N = 93)	P: perceived neigh. danger (PR, CR) O: child distress, child misconduct (PR, CR, TR)	■ "structural" risk → (+) PR/CR distress, but fully mediated by parent/child perceptions ■ risk → (+) PR misconduct, but fully mediated by parent perceptions ■ parent perceived danger → (+) PR distress, misconduct ■ child perceived danger → (+) CR distress ■ parent, child perceptions → (NS) TR distress, misconduct
Geis & Ross (1998)	Community, Crime, and Health Survey of Illinois adults (N = 2,482), 1990 Census	Tracts (N = 1,169)	P: perceived disorder (physical, social), social ties with neighbors O: perceived powerlessness	■ ties → (−) powerlessness ■ disorder → (+) powerlessness
Ross (2000)	Same as above	Same as above	P: perceived disorder O: depression	■ disorder → (+) depression ■ disadvantage → (+) depression, but fully mediated by disorder

Ross et al. (2000)	Same as above	Same as above	P: perceived disorder, informal ties with neighbors, fear, powerlessness O: distress (depression, anxiety)	■ stability → (−) distress in low poverty areas; stability → (+) distress in high poverty areas ■ perceived disorder fully mediates above effects, but informal ties do not ■ ties → (−) distress, disorder → (+) distress, tested separately in a reduced model ■ disorder, powerlessness, fear, fear-powerlessness interaction → (+) distress in full model (excluding ties)
Elliott (2000)	Nevada survey of adults (N = 361), 1990 Census	Zip codes, (N not reported)	P: social integration O: depression	■ integration → (−) depression, but only in high SES neighborhoods
Silver (2000)	Pittsburgh Violence Risk Assessment Study of psychiatric patients (N = 270); 1990 Census	Tracts (N = 145)	P: perceived support O: patient violence	■ support → (NS) violence ■ disadvantage → (+) violence, and not mediated by social support
Wikstrom & Loeber (2000)	Pittsburgh Youth Study, survey of fourth and seventh grade boys (N = 1,014), 1990 Census	Neighborhood units (i.e., tract aggregates) (N = 90)	P: peer delinquency O: serious offending	■ peer delinquency → (+) offending, early onset ■ disadvantage → (+) offending for those with a high or balanced score of risk & protective factors; holds for late onset only ■ disadvantage → (NS) offending for high risk boys ■ risk profile → (NS) offending in high disadvantage areas

(*Continued*)

TABLE 3 (*Continued*)

Author(s)	Data sources and sample	Neighborhood units	Process (P) and Outcome (O) measures	Main findings
Kowaleski-Jones (2000)	National Long. Survey of Youth Merged Mother-Child Files (N = 860, age 14–18), 1990 Census	Zip codes (N not reported)	P: "perceived context": neighborhood problems O: risk taking, aggressive behavior index	■ neighborhood problems → (+) aggressive behavior (in reduced model) ■ neighborhood problems → (NS) aggressive behavior, risk taking (in full model) ■ stability maintained strongest effect
Brody et al. (2001)	Family and Community Health Study, survey of youth-caretaker pairs in Iowa and Georgia (N = 867), 1990 Census	Community clusters (N = 41)	P: collective socialization, community deviance (caregiver, child reports) O: affiliation with deviant peers (child report)	Clustering used to create "disadvantage" measure ■ community deviance → (+) affiliation ■ collective socialization → (−) affiliation, stronger as disadvantage increases ■ above effects of process were found for child reports only
Seidman et al. (1998)	Survey of New York City middle/high school students (N = 754), 1990 Census	Tracts (N = 203)	P: "experiential neighborhood": daily hassles (e.g., fear), cohesion, social activities, peer values O: antisocial behavior index (delinquency, alcohol use, negative peer involvement)	Experiential neighborhood clustering: ■ negative neighborhood experience, peer antisocial values → (+) antisocial behavior ■ moderate risk areas → (+) antisocial behavior, holding only for high school students and those perceiving hassles in neighborhood

- *Concentrated Poverty and Structural Characteristics Still Matter*. Although some studies show that social and institutional processes mediate the association of neighborhood structural factors with crime and other aspects of well-being, in many cases they do not explain all or even most of the traditional correlations. Factors such as concentrated disadvantage, affluence, and stability remain direct predictors of many outcomes (Morenoff et al. 2001, South & Baumer 2000, Peterson et al. 2000). Moreover, neighborhood mechanisms are not produced in a vacuum; some social processes, particularly those related to the idea of collective efficacy, appear to emerge mainly in environments with a sufficient endowment of socioeconomic resources and residential stability (Sampson et al. 1999).
- *Disorder—Explanatory Mechanism or Outcome?* The key process indicators proposed by a number of studies relate to social and physical disorder or neighborhood incivilities (e.g., Perkins & Taylor 1996, Rountree & Land 1996, Cohen et al. 2000, Markowitz et al. 2001). Much of the interest in disorder was stimulated by the theory of "broken windows" (Wilson & Kelling 1982), which suggests that physical signs of disorder—such as broken windows, public drinking, and graffiti—signal the unwillingness of residents to confront strangers, intervene in a crime, or call the police. However, there is evidence that the direct link between disorder and crime is not as strong as the broken windows theory would suggest, and that disorder is predicted by the same characteristics as crime itself, inducing a spurious relationship (Sampson & Raudenbush 1999, Markowitz et al. 2001). This does not necessarily mean that disorder is irrelevant. Because signs of disorder are stark visual reminders of neighborhood deterioration, they may trigger institutional disinvestment, out-migration, and a general malaise among residents (Sampson & Raudenbush 1999, Ross 2000, Perkins & Taylor 1996). Further research is needed to determine whether disorder is etiologically analogous to crime, a cause of crime (see broken windows theory), a mechanism that has independent consequences for mental health, or some combination thereof.

METHODOLOGICAL CHALLENGES

Despite recent progress, a daunting number of complex challenges remain in assessing neighborhood effects. Indeed, methodological issues such as the differential selection of individuals into communities, indirect pathways of neighborhood effects, measurement error, and simultaneity bias (what is causing what?) represent serious obstacles to drawing definitive conclusions on the causal role of neighborhood social context (Duncan & Raudenbush 1999, Sobel 2001, Winship & Morgan 1999). The ubiquitous use of the phrase "neighborhood effects" is thus quite problematic from a methodological standpoint. Neighborhoods are also much more heterogeneous internally and less monolithic than commonly believed

(Cook et al. 1997),[9] and as noted earlier (see also Raudenbush & Sampson 1999), far too many studies simply treat neighborhood processes as one more variable to tag onto individuals.

Selection Bias and Experimental Designs

Although a full discussion is beyond the scope of this paper, the issue of selection bias is probably the biggest challenge facing neighborhood-level research. How do we know that the area differences in any outcome of interest, such as adolescent delinquency, are the result of neighborhood factors rather than the differential selection of adolescents or their families into certain neighborhoods?[10] A recent body of research has directly taken up this issue by examining an ongoing housing program in five major cities across the United States. The Moving to Opportunity (MTO) demonstration is a U.S. Department of Housing and Urban Development project in Boston, Baltimore, New York City, Chicago, and Los Angeles (see Katz et al. 2001 and http://www.wws.princeton.edu/~kling/mto/). Based on findings from the Gautreaux program in Chicago showing improved outcomes for children and adults (Rosenbaum 1995), the MTO program was designed to test whether families who moved from inner-city, high-poverty areas to low-poverty areas could attain the apparent improvements seen in Chicago.

The MTO program utilized an experimental design by randomly assigning eligible applicants to one of three groups, two of which received some form of treatment in the form of Section 8 vouchers or certificates, and a control group that received no experimental treatment.[11] This process of random assignment provides an almost unique opportunity to separate the role of neighborhood context from the selection bias that may arise from residential mobility decisions. A key issue, however, is that not all subjects take up the experimental treatment. To address

[9]It is often noted, in this regard, that more of the variance in almost any outcome lies within rather than between neighborhoods. Yet large neighborhood differences (and potential intervention effects) are not incompatible with the low between-neighborhood variance components that are commonly observed (see Duncan & Raudenbush 1999).

[10]Economists have been most forthright in addressing selection bias and individual choice. For an extended discussion of selection and identification problems in neighborhood-effects research, see Manski (1993). For a non-experimental approach to the endogeneity of neighborhood processes and social interactions, see Durlauf (2001). Excellent sociological approaches to statistical inference are Winship & Morgan (1999) and Sobel (2001).

[11]Families were deemed eligible if they were public housing or Section-8 assisted housing residents with children and lived in a census tract with a poverty rate greater than or equal to 40%. Eligible applicants were randomly selected from a waiting list and randomly assigned to one of three groups: a control group whose members received no change in assistance; a Section-8 comparison group (S-8) that received rental certificates or vouchers without geographical restrictions and no special assistance; and an experimental group (MTO) that received vouchers or housing certificates with a requirement that they move to a low poverty area (less than 10%). MTO participants also received counseling and housing assistance.

this issue, MTO Treatment-on-Treated (TOT) analysis compares the outcomes of families who actually received the treatment (those who actually move, whether in the location-restricted or -unrestricted groups) to the outcomes of control-group families who would have accepted the treatment had it been offered. The Intent-to-Treat (ITT) analysis compares the average outcomes for either treatment group with those of the control group, estimating the effect of being *offered* the treatment, regardless of whether the family decided to accept the certificate/voucher and move (Katz et al. 2001).

In Table 4 we summarize the findings from the experimental literature. Preliminary evidence is generally positive for the outcomes of movers to low-income areas, in accordance with the early Gautreaux Project. Generally, families that moved to low-poverty areas experienced improved outcomes vis-à-vis overall health (physical and mental), safety, boys' problem behavior, and well-being (Katz et al. 2001, Ludwig et al. 2001, Rosenbaum & Harris 2001). A reduction in behavior problems among boys was found in Boston (Katz et al. 2001) as well as in Baltimore (Ludwig et al. 2001). The large reduction in juvenile arrests for violent offenses in Baltimore was accompanied by an increase in juvenile arrests for property offenses, although the latter finding pertains only to the intent-to-treat specification and did not hold up when preprogram characteristics were adjusted.

Despite the importance of experiments, we should not lose sight of their limitations. Selection bias must still be considered in the form of differential take-up rates and dropout from the program. Most important from our perspective, the random assignment of housing vouchers does not address causal processes of *why* neighborhoods matter. When MTO families move from one neighborhood to another, entire bundles of variables change at once, making it difficult to disentangle the change in neighborhood poverty from simultaneous changes in social processes (Katz et al. 2001, p. 621). The clear tendency has been to interpret MTO results in terms of the effects of changing concentrated poverty, but for the reasons expressed in this paper, such an assertion is arbitrary—any number of changes in social processes associated with poverty may account for the result. Note also that MTO does not randomly allocate neighborhood conditions to participants; voucher recipients can choose to live in any number of middle-class neighborhood conditions. Thus, while MTO may provide policy makers with evidence on whether offering housing vouchers can improve the lives of poor children, it is less satisfactory to social scientists interested in explaining the mechanisms of neighborhood effects.

Overcontrol and Indirect Pathways

Much research on neighborhoods is inconsistent with the logical expectations set forth by contextual theories that stress enduring effects and developmental pathways (Sampson 2001). The most common strategy in multilevel neighborhood research is to estimate a direct effects model whereby a host of individual, familial, peer, and school variables are entered as controls alongside current neighborhood

TABLE 4 Summary of Moving To Opportunity (MTO) findings.

Study	Site and sample	Data sources and Outcomes (O)	Main findings
Ludwig et al. (2001)[a]	Baltimore N = 336 (age 11–16)	MTO Baseline Survey, Dept. Juvenile Justice O: juvenile arrests	TOT: MTO & S8: (−) violent crime; S8 (−) other crime, all crimes ITT: MTO: (−) violent crime (adjusted only), (+) property crime (unadjusted only); S8: (−) violent crime (incidence only); (−) all crimes (adjusted only, incidence only)
Katz et al. (2001)[a]	Boston N = 612 (age 6–15) N = 540 (adults)	MTO Baseline Survey, Boston Follow-up Survey, administrative records, 1990 Census O: multiple–child (behavioral, health) and adult (income, health)	TOT/ITT: MTO & S8: (NS) received AFCD/TANF, positive earnings; (+) overall adult health, adults calm and peaceful; (−) boys' behavior problems, (−) girls w/ close friend TOT/ITT: MTO: (−) injuries, asthma attacks, (+) safety (on 6 of 7 measures); S8: (+) safety (on 3 of 7 measures)
Rosenbaum & Harris (2001)[b]	Chicago N = 120 (adults)	Baseline Survey, Chicago Follow-up Survey, Urban Institute Underclass Database	■ MTO & S8 Movers: (−) social/physical disorder, risks for teenagers; (+) feelings of safety ■ MTO Movers v. S8 Movers: (−) social/physical disorder; (−) risks for teenagers; (−) ratings of transportation access

[a](−) denotes a significant decrease on noted outcomes and (+) a significant increase, both in comparison to control groups. "Unadjusted" denotes findings without pre-program controls for individual characteristics; "adjusted" includes such controls. See text for distinctions between "TOT" and "ITT".

[b]Findings are based on MTO- and S8-Movers' comparisons of destination neighborhoods to neighborhoods of origin.

characteristics of residence. But this strategy confounds the potential importance of both long-term community influences and mediating developmental pathways regarding children's personal traits and dispositions, learning patterns from peers, family socialization, school climate, and more. Put differently, static models that estimate the direct effect of current neighborhood context on a particular outcome (e.g., delinquency, level of academic achievement) may be partitioning out relevant variance in a host of mediating and developmental pathways of influence. The general misuse of control variables in sociology (Lieberson 1985) thus appears to be exacerbated in the case of neighborhood effects.[12]

Event-Based Models

Another disconnect between theory and design is tied to the common practice in neighborhood-effects research of looking solely at the characteristics of the individual's place of residence. Although seemingly natural, a problem with this approach is that many behaviors of interest (e.g., stealing, smoking, taking drugs) unfold in places (e.g., schools, parks, center-city areas) outside of the residential neighborhoods in which the individuals involved in these behaviors live. Consider the nature of routine activity patterns in modern U.S. cities, where residents traverse the boundaries of multiple neighborhoods during the course of a day. Adolescents occupy many different neighborhood contexts outside of home, especially in the company of peers. Even children experience more residential environments than we commonly expect (Burton et al. 1997, p. 135). This is a problematic scenario for neighborhood research seeking to explain contextual effects on individual differences in behavior. For example, it is possible for the prevalence of participation in some crimes to be spread fairly evenly across individuals living in many neighborhoods, even as crime events are highly concentrated in relatively few neighborhoods. This sort of neighborhood effect on events (typical of drug markets, for example, where buyers often come from afar) is obscured in current practice. It thus pays to take seriously contextual theories that focus more on behavioral events than individual differences—for example, how neighborhoods fare as units of guardianship or socialization over their own public spaces. The crime-rate literature often takes this strategy by locating the incidence of crime events rather than the residence of offenders (e.g., see Table 1).

[12]In a recent study that charts a welcome change in pace (but with an outcome falling outside our selection criteria), Axinn & Yabiku (2001) examined the relationship between macro-level social change and individual child-bearing (or fertility) behavior in Nepal. They found evidence of both enduring effects of childhood community context and independent effects of adult community context on women's childbearing behavior. From this finding, the authors rightly advocate for a more comprehensive view of enduring contextual influences (Axinn & Yabiku 2001:1252), accounting for multiple developmental influences across the life course.

NEW DIRECTIONS IN STUDYING NEIGHBORHOOD PROCESSES

The basic argument that unites our assessment is that research needs to take seriously the measurement and analysis of neighborhoods as important units of analysis in their own right, especially with regard to social-interactional and institutional processes. We focus on five directions for designing research on the neighborhood context of child and adolescent well-being that build on the idea of taking neighborhood social processes, and hence ecometrics, seriously: (*a*) redefining neighborhood boundaries in ways that are more consonant with social interactions and children's experiences, (*b*) collecting data on the physical and social properties of neighborhood environments through systematic social observations, (*c*) taking account of spatial interdependence among neighborhoods, (*d*) analyzing the dynamics of change in neighborhood social processes, and (*e*) collecting benchmark data on neighborhood social processes.

Neighborhood Boundaries

Although predominant in the literature, the strategy of defining neighborhoods based on Census geography and using tracts or higher geographical aggregations as proxies for neighborhoods is problematic from the standpoint of studying social processes. The micro-dimensions of neighborhood interaction may be particularly important for child well-being because of the spatial constraints on children's patterns of daily activities. A new approach to defining neighborhoods, as seen in Grannis's (1998, 2001) recent studies of Los Angeles, San Francisco, Pasadena, CA, and Ithaca, NY, delineates ecological contexts based on the geography of street patterns. Using a Geographic Information System (GIS), Grannis (1998, 2001) defines residential units that he calls "tertiary communities" by delineating aggregations of street blocks that are reachable by pedestrian access—meaning that pedestrians can walk through the area without having to cross over a major thoroughfare. Grannis compares communities defined by residential street patterns to data on the social networks of neighbors, including residents' cognitive maps of their neighborhoods and areas of social interaction (see also Coulton et al. 2001). He finds that residents interact more with people living within their tertiary communities than with people who live nearby but across major thoroughfares.

The micro-ecology of pedestrian streets bears directly on patterns of interaction that involve children and families. Parents are generally concerned with demarcating territory outside of which their children should not wander unaccompanied by an adult, to ensure that their children stay in areas that are safe for play and conducive to adult monitoring. To the extent that these limited spaces of children's daily activities usually do not cross major thoroughfares, defining tertiary communities may provide a foundation for constructing neighborhood indicators of child well-being and social processes more generally.

Systematic Social Observation

Another movement in neighborhood research is to collect data that more directly reflect the sights, sounds, and feel of the streets. The motivation behind collecting observational data is that there are physical and social features of neighborhood environments that cannot be reliably captured in surveys but that provide very tangible contexts for child development. Consider the example of using systematic social observation of street blocks (Sampson & Raudenbush 1999). Between June and October 1995, observers drove a sport utility vehicle (SUV) at about 3–5 miles per hour down every street within a sample of Chicago neighborhoods. To observe each block face (one side of a street within a block), a pair of video recorders and a pair of trained observers (one of each located on each side of the SUV) simultaneously captured social activities and physical features of both block faces. The observers recorded their observations onto a written log for each block face, also making commentaries into the videotape audio whenever relevant. Applying these procedures, a total of 23,816 block faces were observed and video-recorded.

By observing block faces, data can be aggregated to any level of analysis desired (e.g., block, block group, housing project, or neighborhood) to characterize social and physical characteristics. Such data can be exploited to build new measures of micro-neighborhood contexts. For example, flexible neighborhood indicators can be constructed that bear on child well-being, including such validated measures as *physical disorder* (e.g., the presence or absence of cigarettes in the street, garbage, empty beer bottles, graffiti, abandoned cars); *social disorder* (e.g., presence or absence of adults loitering, drinking alcohol in public, public intoxication, adults fighting, prostitution); *physical condition of housing* (e.g., vacant houses, burned out houses or businesses, dilapidated parks), and *alcohol and tobacco influence* (e.g., presence of alcohol signs and tobacco signs on a block, presence of bars and liquor stores on a block). Direct measures of street-level social interactions (e.g., adults playing with children) can also be constructed.

A limitation of systematic social observation is that it is relatively expensive and tedious to videotape block faces and then code the resulting tapes. However, one might implement this methodology on a wider scale by having interviewers observe and rate city blocks on foot while they are out in the field conducting interviews. If this methodology, which is substantially cheaper than using videotapes, yields comparably reliable measures, it could serve as a model for integrating systematic social observation with traditional surveys.

Spatial Dynamics of Child Well-Being

A third trend in neighborhood research is the expansion of community context to include nearby areas outside of the formal boundaries of a given neighborhood, however defined. The general idea is that social behavior is influenced not only by what happens in one's immediate neighborhood, but also by what happens in surrounding areas (Morenoff et al. 2001, Smith et al. 2000). For example, the

benefits of collective efficacy may accrue not just to the residents of a particular neighborhood, but potentially to residents in adjacent areas as well (Sampson et al. 1999). Parents who send their child to play with friends in a nearby neighborhood, where residents tend to engage in collective supervision and monitoring, derive a spatial advantage much in the same way that they would benefit from living next to a park or a good school. By contrast, neighborhoods with minimal expectations for social control and sparse interfamily exchange produce spatial disadvantages for parents and children who live in adjoining areas.

This framework has implications for understanding residential stratification. For example, if African-American neighborhoods are embedded in more disadvantaged environments than are similarly endowed white neighborhoods, then the consequences of racial segregation may be greater and more systemic than previously thought. Patillo-McCoy's (1999) ethnographic study of "Groveland," a community in Chicago, suggests that black middle-class families face such a spatial (and structural) disadvantage. Despite networks of social control, she found that black middle-class families must constantly struggle to escape the problems of drugs, violence, and disorder that spill over from neighboring communities. The clear implication of such spatial dynamics for the study of child well-being is that community indicators that focus on processes or outcomes internal to a given neighborhood are getting only part of the story. Newly developed techniques for analyzing and displaying the connection of social and spatial processes are thus important for progress in neighborhood-effects research.[13]

Dynamics of Change

In addition to spatial dynamics there is a clear need for rigorous longitudinal studies of neighborhood temporal dynamics. Just as individuals change, develop, and are sometimes transformed, so too neighborhoods are dynamic entities. One of the appealing features of the recent focus on social processes, at least from a theoretical perspective, is the recognition that processes such as social control, reciprocal exchange, and epidemics are rooted in dynamic aspects of social life, as compared to the more common focus on static, compositional characteristics (such as race) that are not fundamentally causal variables (Winship & Morgan 1999). It is painfully ironic, however, that most studies of social process are, methodologically at least, cross-sectional in nature. We have scant information on how neighborhood processes evolve over time, or how they interact with alleged outcomes. The limited research that does exist (e.g., Bellair 2000) points to complex interactions and feedback processes among structural constraints, social ties, and behaviors such as crime. Researchers thus need to redouble their efforts to investigate neighborhood social processes in truly dynamic, interactive fashion.

[13]See http://phdcn.harvard.edu/res_pubs/maproom/index.html for examples of maps displaying spatial advantages and disadvantages that transcend neighborhood boundaries.

Toward a Benchmark of Ecometric Data

A final step in fostering progress would be to support the systematic collection of benchmark data on social environments that can be compared across communities. The goal would be to develop a standardized approach to the collection and dissemination of data that individual communities can use to evaluate where they stand in regard to national and/or regional norms. Similar to school report cards that track the progress of educational reform, a standardized approach to assessing collective properties would eventually allow local communities to gauge how well or poorly they are doing. For example, the Sustainable Seattle project has combined archival records, census data, and surveys to compile sustainability trends across communities in diverse areas of concern (e.g., economic resources, literacy, low birthweight, neighborliness). The Leaders Roundtable in Portland, Oregon has undertaken a similar initiative to collect data on community health using a combination of focus groups, surveys, key stakeholder interviews, and document reviews. More ambitiously, Robert Putnam recently launched a benchmark survey both nationwide and in about 40 American communities, with the goal of assessing baseline levels of social capital and eventually changes over time (see http://www.cfsv.org/communitysurvey/).

CONCLUSION

There is little doubt that numerous problems hinder the estimation of neighborhood effects. Many of these complex challenges have been discussed in this paper. Still, we would conclude on a positive note by arguing that we now know quite a bit. As reviewed, the evidence is solid on the ecological differentiation of American cities along socio-economic and racial lines, which in turn corresponds to the spatial differentiation of neighborhoods by multiple child, adolescent, and adult behaviors. These conditions are interrelated and appear to vary in systematic and theoretically meaningful ways with hypothesized social mechanisms such as informal social control, trust, institutional resources and routines, peer-group delinquency, and perceived disorder (Tables 1–3). An important take-away of our assessment is that these and other neighborhood-level mechanisms can be measured reliably with survey, observational, and archival approaches. Another finding is that extra-local neighborhood mechanisms appear with considerable strength, suggesting that spatial externalities operate above and beyond the internal neighborhood characteristics of traditional concern.

Despite progress, fundamental questions remain. Even when directly focused on social processes, the many differences in research design and measurement across studies in Tables 1–4 make it difficult to provide an overall estimate of the magnitude of associations. We also know little about the causes of key social processes or whether they are responsive to neighborhood policy interventions. For example, what produces or can change collective efficacy and institutional capacity? Although much effort has been put into understanding the structural

backdrop to neighborhood social organization, we need a deeper focus on cultural, normative, and collective-action perspectives that attach meaning to how residents frame their commitment to places. Another limitation of neighborhood-effects research has been its lack of attention to measuring peer networks and the connection of neighborhoods and school processes.

Perhaps the main threat to neighborhood-effects research is individual selection bias, although even here we would view the news as somewhat encouraging. As the nascent experimental literature (Table 4) has demonstrated, when randomization is invoked we still find evidence for the apparent influence of place. We applaud the MTO experimental turn, but caution that the task remains to specify the exact mechanisms of transmission. An ideal, albeit difficult, strategy would be to combine experimental assignment of neighborhood conditions with a longitudinal assessment of changes in social processes and individual behaviors. We would also caution against the common tendency to view selection bias as an individual trait and a nuisance to be controlled. When individuals select neighborhoods, they appear to do so based on social characteristics such as neighborhood racial segregation, economic status, and friendship ties. Research needs to better understand the mutual interplay of neighborhood selection decisions, structural context, and social interactions (e.g., Durlauf 2001).

Armed with methodological advances in ecometrics that are improving our prospects for measuring neighborhood social processes, we are optimistic regarding the next generation of research that takes up these and other challenges. When combined with advances in defining micro-neighborhood contexts based on street patterns, systematically observing public spaces, longitudinal-experimental designs, and detecting spatial dynamics, contextual research on the dynamic sources of child, adolescent, and even adult development has a bright future indeed.

ACKNOWLEDGMENTS

We thank Sandy Jencks and John Goering for their critical feedback.

The *Annual Review of Sociology* is online at http://soc.annualreviews.org

LITERATURE CITED

Almgren G, Guest A, Imerwahr G, Spittel M. 1998. Joblessness, family disruption, and violent death in Chicago, 1970–1990. *Soc. Forces* 76(4):1465–93

Aneshensel CS, Sucoff CA. 1996. The neighborhood context of adolescent mental health. *J. Health Soc. Behav.* 37:293–310

Axinn WG, Yabiku ST. 2001. Social change, the social organization of families, and fertility limitation. *Am. J. Sociol.* 106(5):1219–61

Baumer EP, South SJ. 2001. Community effects on youth sexual activity. *J. Marriage Fam.* 63:540–54

Bellair PE. 1997. Social interaction and community crime: examining the importance of neighbor networks. *Criminology* 35(4):677–703

Bellair PE. 2000. Informal surveillance and street crime: a complex relationship. *Criminology* 38(1):137–67

Brody GH, Ge X, Conger R, Gibbons FX, Murry VM, et al. 2001. The influence of neighborhood disadvantage, collective socialization, and parenting on African American children's affiliation with deviant peers. *Child Dev.* 72(4):1231–46

Brooks-Gunn J, Duncan GJ, Klebanov PK, Sealand N. 1993. Do neighborhoods influence child and adolescent development? *Am. J. Sociol.* 99(2):353–95

Brooks-Gunn J, Duncan GJ, Aber JL, eds. 1997a. *Neighborhood Poverty*: Vol. I: *Context and Consequences for Children*. New York: Russell Sage Found.

Brooks-Gunn J, Duncan GJ, Aber JL, eds. 1997b. *Neighborhood Poverty*: Vol. II: *Policy Implications in Studying Neighborhoods*. New York: Russell Sage Found.

Burton LM, Jarrett RL. 2000. In the mix, yet on the margins: the place of families in urban neighborhood and child development research. *J. Marriage Fam.* 62:1114–35

Burton LM, Price-Spratlen T, Spencer MB. 1997. On ways of thinking about measuring neighborhoods: implications for studying context and developmental outcomes for children. See Brooks-Gunn et al. 1997b, pp. 132–44

Cohen D, Spear S, Scribner R, Kissinger P, Mason K, Widgen J. 2000. "Broken windows" and the risk of gonorrhea. *Am. J. Pub. Health* 90:230–36

Coleman JS. 1988. Social capital in the creation of human capital. *Am. J. Sociol.* 94: S95–120

Cook TD, Shagle SC, Degirmencioglu SM. 1997. Capturing social process for testing mediational models of neighborhood effects. See Brooks-Gunn et al. 1997b, pp. 94–119

Coulton CJ, Korbin J, Chan T, Su M. 2001. Mapping residents' perceptions of neighborhood boundaries: a methodological note. *Am. J. Community Psychol.* 29:371–83

Coulton CJ, Korbin JE, Su M. 1999. Neighborhoods and child maltreatment: a multi-level study. *Child Abuse Negl.* 23:1019–40

Cutrona CE, Russell DW, Hessling RM, Brown PA, Murry V. 2000. Direct and moderating effects of community context on the psychological well-being of African American women. *J. Pers. Soc. Psychol.* 79:1088–101

Duncan GJ, Raudenbush SW. 1999. Assessing the effects of context in studies of child and youth development. *Educ. Psychol.* 34:29–41

Durlauf S. 2001. A framework for the study of individual behavior and social interactions. *Sociol. Methodol.* 31(1):47–87

Earls F, Carlson M. 2001. The social ecology of child health and well-being. *Annu. Rev. Pub. Health* 22:143–66

Elliott M. 2000. The stress process in neighborhood context. *Health Place* 6:287–99

Elliott DS, Wilson WJ, Huizinga D, Sampson RJ, Elliott A, Rankin B. 1996. The effects of neighborhood disadvantage on adolescent development. *J. Res. Crime Delinq.* 33:389–426

Furstenberg FF Jr, Cook TD, Eccles J, Elder GH Jr, Sameroff A. 1999. *Managing to Make It: Urban Families and Adolescent Success*. Chicago: Univ. Chicago Press

Geis KJ, Ross CE. 1998. A new look at urban alienation: the effect of neighborhood disorder on perceived powerlessness. *Soc. Psychol. Q.* 61:232–46

Gephart MA. 1997. Neighborhoods and communities as contexts for development. See Brooks Gunn et al. 1997a, pp. 1–43

Gorman-Smith D, Tolan PH, Henry DB. 2000. A developmental-ecological model of the relation of family functioning to patterns of delinquency. *J. Quant. Crim.* 16(2):169–98

Grannis R. 1998. The importance of trivial streets: residential streets and residential segregation. *Am. J. Sociol.* 103(6):1530–64

Grannis R. 2001. *Street islands: social networks, street networks, and segregation.* Work. Pap., Dep. Sociol., Cornell Univ.

Granovetter MS. 1973. The strength of weak ties. *Am. J. Sociol.* 78(6):1360–80

Hirschfield A, Bowers KJ. 1997. The effect of social cohesion on levels of recorded

crime in disadvantaged areas. *Urban Stud.* 34(8):1275–95

Jencks C, Mayer S. 1990. The social consequences of growing up in a poor neighborhood. In *Inner-City Poverty in the United States*, ed. L Lynn, Jr., MGH McGeary, pp. 111–85. Washington, DC: Natl. Acad. Press

Katz LF, Kling J, Liebman JB. 2001. Moving to Opportunity in Boston: early results of a randomized mobility experiment. *Q. J. Econ.* 116(2):607–54

Kowaleski-Jones L. 2000. Staying out of trouble: community resources and problem behavior among high-risk adolescents. *J. Marriage Fam.* 62:449–64

LaGrange TC. 1999. The impact of neighborhoods, schools, and malls on the spatial distribution of property damage. *J. Res. Crime Delinq.* 36:393–422

Lanctot N, Smith CA. 2001. Sexual activity, pregnancy, and deviance in a representative urban sample of African American girls. *J. Youth Adol.* 30(3):349–72

Leventhal T, Brooks-Gunn J. 2000. The neighborhoods they live in: the effects of neighborhood residence on child and adolescent outcomes. *Psychol. Bull.* 126(2):309–37

Lieberson SL. 1985. *Making It Count*: *The Improvement of Social Research and Theory*. Berkeley: Univ. Calif. Press

Ludwig J, Hirschfield P, Duncan GJ. 2001. Urban poverty and juvenile crime: evidence from a randomized housing-mobility experiment. *Q. J. Econ.* 116(2):665–79

Manski CF. 1993. Identification of endogenous social effects—the reflection problem. *Rev. Econ. Stud.* 60:531–42

Markowitz FE, Bellair PE, Liska AE, Liu J. 2001. Extending social disorganization theory: modeling the relationships between cohesion, disorder, and fear. *Criminology* 39(2):293–319

Massey DS. 1996. The age of extremes: concentrated affluence and poverty in the twenty-first century. *Demography* 33:395–412

Mayer S, Jencks C. 1989. Growing up in poor neighborhoods: How much does it matter? *Science* 243:1441–45

Morenoff JD, Sampson, RJ, Raudenbush SW. 2001. Neighborhood inequality, collective efficacy, and the spatial dynamics of homicide. *Criminology* 39(3):517–60

Park R. 1916. Suggestions for the investigations of human behavior in the urban environment. *Am. J. Sociol.* 20(5):577–612

Pattillo-McCoy M. 1999. *Black Picket Fences: Privilege and Peril Among the Black Middle Class*. Chicago: Univ. Chicago Press

Perkins DD, Taylor RB. 1996. Ecological assessments of community disorder: their relationship to fear of crime and theoretical implications. *Am. J. Community Psychol.* 24: 63–107

Peterson RD, Krivo LJ, Harris MA. 2000. Disadvantage and neighborhood violent crime: Do local institutions matter? *J. Res. Crime Delinq.* 37:31–63

Ramirez-Valles J, Zimmerman MA, Newcomb MD. 1998. Sexual risk behavior among youth: modeling the influence of prosocial activities and socioeconomic factors. *J. Health Soc. Behav.* 39:237–53

Raudenbush SW, Sampson RJ. 1999. 'Ecometrics': Toward a science of assessing ecological settings, with application to the systematic social observation of neighborhoods. *Sociol. Methodol.* 29:1–41

Robert SA. 1999. Socioeconomic position and health: the independent contribution of community socioeconomic context. *Annu. Rev. Sociol.* 25:489–516

Rosenbaum JE. 1995. Changing the geography of opportunity by expanding residential choice—lessons from the Gautreaux program. *Housing Policy Debate* 6:231–69

Rosenbaum JE, Harris LE. 2001. Low-income families in their new neighborhoods. *J. Fam. Issues* 22(2):183–210

Ross CE. 2000. Neighborhood disadvantage and adult depression. *J. Health Soc. Behav.* 41:177–87

Ross CE, Reynolds JR, Geis KJ. 2000. The contingent meaning of neighborhood stability for residents' psychological well-being. *Am. Sociol. Rev.* 65:581–97

Rountree PW, Land KC. 1996. Perceived risk versus fear of crime: empirical evidence of conceptually distinct reactions in survey data. *Soc. Forces* 74:1353–76

Rountree PW, Warner BD. 1999. Social ties and crime: Is the relationship gendered? *Criminology* 37(4):789–813

Sampson RJ. 1997. Collective regulation of adolescent misbehavior: validation results from Chicago neighborhoods. *J. Adolescent Res.* 12(2):227–44

Sampson RJ. 2001. How do communities undergird or undermine human development? Relevant contexts and social mechanisms. In *Does It Take a Village? Community Effects on Children, Adolescents, and Families*, ed. A. Booth, N. Crouter, pp. 3–30. Mahwah, NJ: L Erlbaum

Sampson RJ, Morenoff JD, Earls F. 1999. Beyond social capital: spatial dynamics of collective efficacy for children. *Am. Sociol. Review* 64:633–60

Sampson RJ, Raudenbush SW. 1999. Systematic social observation of public spaces: a new look at disorder in urban neighborhoods. *Am. J. Sociol.* 105(3):603–51

Sampson RJ, Raudenbush SW, Earls F. 1997. Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science* 277:918–24

Scribner RA, Cohen DA, Farley TA. 1998. A geographic relation between alcohol availability and gonorrhea rates. *Sex. Transm. Dis.* 25:544–48

Seidman E, Yoshikawa H, Roberts A, Chesir-Teran D, Allen L, et al. 1998. Structural and experiential neighborhood contexts, developmental stage, and antisocial behavior among urban adolescents in poverty. *Dev. Psychopathol.* 10:259–81

Shumow L, Vandell DL, Posner J. 1998. Perceptions of danger: a psychological mediator of neighborhood demographic characteristics. *Am. J. Orthopsychiatry* 68(3):468–78

Silver E. 2000. Extending social disorganization theory: a multilevel approach to the study of violence among persons with mental illnesses. *Criminology* 38:1043–74

Small ML, Newman K. 2001. Urban poverty after *The Truly Disadvantaged*: the rediscovery of the family, the neighborhood, and culture. *Annu. Rev. Sociol.* 27:23–45

Smith WR, Frazee SG, Davison EL. 2000. Furthering the integration of routine activity and social disorganization theories: small units of analysis and the study of street robbery as a diffusion process. *Criminology* 38:489–523

Sobel M. 2001. *What are neighborhood effects?* Paper presented at "Poverty Traps" Conf., Santa Fe Inst., Santa Fe, NM

Sorensen AB. 1998. Theoretical mechanisms and the empirical study of social processes. In *Social Mechanisms: An Analytical Approach to Social Theory*, ed. P Hedström, R Swedberg, pp. 238–66. Cambridge, UK: Cambridge Univ. Press

South SJ, Baumer EP. 2000. Deciphering community and race effects on adolescent premarital childbearing. *Soc. Forces* 78:1379–1407

Steptoe A, Feldman PJ. 2001. Neighborhood problems as sources of chronic stress: development of a measure of neighborhood problems, and associations with socioeconomic status and health. *Ann. Behav. Med.* 23(3):177–85

Stiffman AR, Hadley-Ives E, Elze D, Johnson S, Dore P. 1999. Impact of environment on adolescent mental health and behavior: structural equation modeling. *Am. J. Orthopsychiatr.* 69:73–86

Suttles GD. 1972. *The Social Construction of Communities*. Chicago: Univ. Chicago Press

Upchurch DM, Aneshensel CS, Sucoff CA, Levy-Storms L. 1999. Neighborhood and family contexts of adolescent sexual activity. *J. Marriage Fam.* 61:920–33

Veysey BM, Messner SF. 1999. Further testing of social disorganization theory: an elaboration of Sampson and Groves's "community structure and crime." *J. Res. Crime Delinq.* 36:156–74

Warner BD, Rountree PW. 1997. Local social ties in a community and crime model:

questioning the systemic nature of informal social control. *Soc. Prob.* 44(4):520–36

Welsh WN, Greene JR, Jenkins PH. 1999. School disorder: the influences of individual, institutional, and community factors. *Criminology* 37(1):73–115

Wikstrom POH, Loeber R. 2000. Do disadvantaged neighborhoods cause well-adjusted children to become adolescent delinquents? A study of male juvenile serious offending, individual risk and protective factors, and neighborhood context. *Criminology* 38:1109–42

Wilson JQ, Kelling G. 1982. The police and neighborhood safety: broken windows. *Atlantic Month.* 127:29–38

Wilson WJ. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: Univ. Chicago Press

Winship C, Morgan SL. 1999. The estimation of causal effects from observational data. *Annu. Rev. Sociol.* 25:659–706