

**Neighborhood Structural Inequality, Collective Efficacy,
and Sexual Risk Behavior Among Urban Youth ***

Christopher R. Browning, Ph.D.

The Ohio State University

Lori A. Burrington, J.D., M.A.

The Ohio State University

Tama Leventhal, Ph.D.

Johns Hopkins University

Jeanne Brooks-Gunn, Ph.D.

National Center for Children and Families, Columbia University

Word count: 9,764

Tables: 3

Figures: 1

Running head: Neighborhood structural inequality and sexual risk behavior

Neighborhood Structural Inequality, Collective Efficacy, and Sexual Risk Behavior Among Urban Youth *

We draw on collective efficacy theory to extend a contextual model of early adolescent sexual behavior. Specifically, we hypothesize that neighborhood structural disadvantage, as measured by levels of concentrated poverty, residential instability, and aspects of immigrant concentration, decreases collective efficacy—or the community-level capacity to provide informal social control of youth. In turn, we expect diminished collective efficacy to have consequences for the prevalence of early adolescent sexual partnering. Findings from multinomial logistic regression models of the number of sexual partners among a sample of youth from the Project on Human Development in Chicago Neighborhoods reveal evidence of neighborhood effects on adolescent sexual activity. Concentrated poverty is positively associated with the number of sexual partners during adolescence, controlling for a wide range of family and individual level characteristics. The effect of neighborhood immigrant concentration is curvilinear: the odds of multiple partnering increase as immigrant concentration increases, but then decrease as levels of immigrant concentration approach those of an ethnic enclave. Collective efficacy is negatively associated with having two or more sexual partners and mediates a nontrivial proportion of the effects of structural disadvantage. Neighborhood characteristics account for more than half of the positive effect of African American race on sexual partnership reports by comparison with European Americans and render the racial difference insignificant.

Young adolescents who initiate sexual activity get a “head start” on exposure to risks such as sexually transmitted diseases and unwanted fertility, at a time when their developmental status places them at a disadvantage in the assessment and management of these risks (Keating 1990). In addition to these direct risks, early onset of sexual activity may lead to other indirect outcomes, such as diminished mental health, and increased involvement in other risk behaviors (Meier 2002; Resnick et al. 1997; Tubman, Windle, and Windle 1996). It is not surprising, then, that researchers have devoted considerable attention to the determinants of entry into sexual activity among adolescents (Albert, Brown, and Flanigan 2003).

However, the focus on sexual initiation as the outcome of interest obscures differentiation in sexual risk behavior. Once sexual behavior is initiated, the extent to which it presents a continued and/or accentuated risk depends upon the character and extent of the adolescent’s later sexual involvement. Adolescents may follow quite different paths. Some may opt out of further sexual activity until later adolescence or even adulthood, while others may enter into long-term monogamous relationships. In such cases, subsequent pathways do not amplify the extent of sexual risk associated with early debut. Still other adolescents, however, progress from sexual debut to a series of ephemeral sexual partnerships (Whitaker, Miller, and Clark 2000). These youth, who initiate sexual activity early and go on to have multiple partners during their teenage years, would seem to be at greatest risk for negative outcomes, such as sexually transmitted diseases (STDs), that are associated with adolescent sexual activity.

Here, we extend prior research establishing a linkage between community level social processes and adolescent sexual initiation (Browning, Leventhal, and Brooks-Gunn 2004, 2005), and investigate its application to multiple sexual partnering among youth. Our approach allows for an assessment of the factors that contribute to continued exposure to sex-related risks throughout adolescence: Are neighborhood social processes potentially more powerfully associated with higher risk and more extensive patterns of sexual partnering, by comparison with sexual initiation? The issue is an important one, as young adolescents are socially and physically rooted in the neighborhoods in which they reside. Prolific partnering among adolescents in neighborhood contexts may thus serve to concentrate STD risk in these same contexts.

Research on the determinants of adolescent sexual activity has focused largely on micro-level risk factors. However, as an extension of recent developments in theory and research on the spatial correlates of adolescent behavior, research into adolescent sexual activity has moved beyond an exclusive consideration of family and individual level factors to the contribution of contextual factors, such as neighborhood of residence. Indeed, a number of studies demonstrate the link between neighborhood structural disadvantage and the elevated prevalence of adolescent sexual behavior including multiple partnering (Baumer & South, 2001; Billy, Brewster, and Grady 1994; Brewster 1994a; Brewster 1994b; Ku, Sonenstein, & Pleck, 1993; Ramirez-Valles, Zimmerman, and Juarez 2002; South and Baumer 2000; Upchurch, Aneshensel, Sucoff, and Levy-Storms 1999).

More recent research has explored the *community-level* social mechanisms that may channel the effects of structural disadvantage on adolescent sexual initiation (Browning, Leventhal, and Brooks-Gunn 2004, 2005). This research has its basis in neighborhood theory, which highlights community social organization as a key link between structural disadvantage and individual outcomes (Leventhal and Brooks-Gunn 2000; Sampson, Morenoff, & Gannon-Rowley, 2002). Neighborhoods with high levels of *collective efficacy*—social ties between parents of interconnected youth, attachments to community, and norms regulating adolescent behavior—are likely better able to supplement the direct caregiving and supervisory capacities of parents (Sampson, Raudenbush, and Earls 1997). Neighborhood structural disadvantage, characterized principally by concentrated poverty, residential instability, and ethnic heterogeneity, attenuates this neighborhood-based supervisory capacity (Sampson, Morenoff, and Earls 1999).

In related research, Wilson (1996) has also emphasized the role of neighborhood structural and social organizational factors in the persistence of racial differences in the prevalence of problem behavior among urban youth. Though African American youth exhibit elevated rates of involvement in sexual activity and early childbearing in comparison with European Americans when observed at the individual level, this heightened prevalence may actually tap inequality in the social environments these groups tend to occupy (Brewster 1994b; Wilson 1996; South and Baumer 2000). Indeed, racial differences in sexual initiation have been explained in part by the social structural characteristics of the neighborhoods in which African American adolescents disproportionately reside (Browning, Leventhal, and Brooks-Gunn 2004).

In this research, we apply the collective efficacy approach to the case of adolescent multiple sexual partnering, considering the impact of structural disadvantage and collective efficacy—operationalized as the combined influence of intergenerational closure, social cohesion, and informal social control orientations toward local youth—on the accumulation of sexual partners during the early teenage years. We describe and test this collective efficacy approach to the influence of neighborhood on adolescent sexual risk using data from the Project on Human Development in Chicago Neighborhoods (PHDCN). The multilevel design of the PHDCN data, with its focus on the role of neighborhood in the development of children and adolescents, is well-suited for our analyses. We employ multinomial logit models to examine the extent to which 1) neighborhood structural disadvantage influences the number of sexual partners during adolescence, above and beyond micro level context; 2) collective efficacy exerts unique influence on adolescent sexual behavior and mediates any observed effects of structural disadvantage; and 3) racial differences in the number of adolescent sexual partners persist after accounting for neighborhood contextual factors as well as a host of individual level factors.

Theoretical Background

NEIGHBORHOOD STRUCTURE AND ADOLESCENT SEXUAL BEHAVIOR

Collective efficacy theory links key aspects of urban neighborhood structure with variability in dimensions of social organization relevant to adolescent outcomes. The first of these structural characteristics is the concentration of economic disadvantage

within contemporary urban neighborhoods. Stark socioeconomic inequalities across neighborhoods (Wilson 1996) and associated patterns of racial segregation (Krivo and Peterson 1996; Massey and Denton 1993) can deprive communities of resources essential to the development of children and adolescents (Jencks and Mayer 1990). Widespread poverty and unemployment at the neighborhood level substantially limit the availability of economic and social resources that are vital to sustaining schools, local voluntary organizations and other local institutions.

Neighborhood socioeconomic disadvantage has been linked with early sexual activity and related outcomes in a number of studies. (Baumer and South 2001; Billy, Brewster, and Grady 1994; Brewster 1994a; Brewster 1994b; Brooks-Gunn, Duncan, Klebanov, and Sealand 1993; Ku, Sonenstein, and Pleck 1993; Ramirez-Valles, Zimmerman, and Newcomb 1998). Evidence also suggests that neighborhood SES accounts, in part, for racial differences in the prevalence of early sexual activity and childbearing (Baumer and South 2001; Brewster 1994b; South and Baumer 2000; Wilson 1996).

Another structural factor—and a potential correlate of economic disadvantage—is the level of instability in residential tenure. Communities that experience rapid turnover in local population and diminished rates of homeownership are less likely to develop viable social networks. Community solidarity also suffers in residentially unstable areas: in the absence of a stable population, well-defined neighborhood identities are less likely to emerge.

Third, ethnic and racial heterogeneity may impede informal communication within neighborhoods, affecting the development of network ties across groups. In the context

of Chicago, we focus on the role of immigrant concentration in influencing the number of adolescent sexual partnerships, taking into account the potentially complex relationship between this feature of neighborhood context and individual outcomes. At low levels, increasing immigrant concentration may compromise social organization across diverse neighborhood groups. At high levels of immigrant concentration, i.e., in ethnic “enclaves,” adolescents may benefit from high degrees of social homogeneity and cohesion around more traditional normative orientations toward sexual behavior among youth.

The effects of structural deficits on local institutions, neighborhood attachments, and network ties may impede the ability of community residents to achieve common goals, including the informal social control of neighborhood youth (Sampson 1997). In short, structural characteristics of neighborhoods may influence community-level mechanisms that have consequences for adolescent behavior—specifically, neighborhood cohesion and the capacity for informal social control. Sampson and colleagues describe these aspects of social organization as *collective efficacy* (Sampson, Morenoff, and Earls 1999). The concept of collective efficacy refers to the extent of mutual trust, solidarity, and shared values among community residents (i.e., social cohesion) combined with common expectations for pro-social action on behalf of collective goals (i.e., informal social control) (Portes 1998; Sampson, Raudenbush, and Earls 1997). Cohesion among residents serves as social capital that may facilitate joint action on behalf of the community.

NEIGHBORHOOD COLLECTIVE EFFICACY AND ADOLESCENT SEXUAL BEHAVIOR

Communities that maintain high levels of collective efficacy may be better able to monitor and regulate the prevalence of both public behaviors such as street delinquency as well as more typically private behaviors such as adolescent sexual activity.

Understanding this process requires attention to multiple dimensions of collective efficacy. First, Coleman (1990) has described *intergenerational closure* as the set of social relationships linking parents with the parents of their children's friends. These ties may be specifically relevant to the management of adolescent behaviors—particularly adolescent sexual behaviors. While individual parents cannot be everywhere at all times, the parents of children within a social network may work together to supervise their children's behavior, disseminating information, sharing supervision responsibilities, and reinforcing norms regarding acceptable behavior, with potential implications for the regulation of problem behaviors among neighborhood youth (Sampson, Morenoff, and Earls 1999) including sexual activity.

Intergenerational social ties, however, must be supplemented by supporting norms in order to yield collective benefits for youth (Sampson, Morenoff, and Earls 1999). The effective regulation of adolescent behavior is facilitated when extra-familial intergenerational social relationships combine with expectations for adult action on behalf of local youth. These shared expectations may lead both to more effective supervision of local adolescents as well as the development of community-level programs directed at involvement in conventional activities (such as after school programs, or youth recreation centers), thereby discouraging delinquent alternatives, including risky

sexual behaviors. We test the hypothesis that collective efficacy exerts a direct effect on the likelihood of multiple sexual partnering, above and beyond predisposing family and individual factors.

These mechanisms have been found to discourage early sexual initiation (Browning, Leventhal, and Brooks-Gunn 2004, 2005), however, they may be particularly relevant in the control of multiple sexual partnering. Intergenerational ties rooted in shared expectations for adolescent behavior, for example, will be overtly challenged when more adolescents are involved in sexual activities. Although some parents may not expressly disapprove of an adolescent's involvement in a single, more committed sexual relationship, few parents are likely to endorse multiple, short-term, or predatory sexual partnering due to the risks involved and the apparent lack of emotional investment. Thus, parents are more likely to share expectations regarding adolescent sexual behavior when the behavior in question is multiple partnering. Moreover, parents of children in a social network are more likely to become aware of their children's activities in the event of multiple partnering. Therefore, we expect that the combined influence of intergenerational closure, social cohesion, and expectations for active support and supervision of youth by local adults will exert regulatory effects on adolescent multiple sexual partnering. Empirical investigation of the determinants of youth sexual behavior has yet to examine the unique effects of neighborhood level collective efficacy on higher risk multiple sexual partnering practices among youth.

FAMILY, PEER, AND INDIVIDUAL LEVEL DETERMINANTS OF ADOLESCENT SEXUAL BEHAVIOR

Any evaluation of neighborhood context and its role in adolescent outcomes must account for family, peer, and individual level factors relevant to the onset of problem behavior in adolescence (Brooks-Gunn and Furstenberg 1989; Jessor, Turbin, and Costa 1998). We consider a host of factors that may be confounded with neighborhood of residence to address, in part, the concern that any neighborhood effects observed are capturing unmeasured family and individual level factors with which neighborhood factors may be correlated.

Parents with limited economic resources are constrained in their capacity to provide opportunities for children and facilitate the avoidance of risk, including early sexual activity (Duncan and Brooks-Gunn 1997; Lauritsen 1994; McLanahan and Sandefur 1994). When family resources are further taxed by the added demands of large household size or single or step-parenthood, individual adolescent outcomes may be further compromised (Wu and Thompson 2001; Dornbusch, Carlsmith, and Bushwall 1985). In turn, family structural disadvantage may influence the proximate determinants of adolescent sexual behavior through its impact on the formation of positive social attachments between parents and youth, and the capacity for parental supervision and monitoring (Conger, Rueter, and Conger 2000; Conger, Ge, Elder, Lorenz, and Simons 1994; McLoyd and Wilson 1990). Variation in key family processes, in turn, may also contribute to risk-enhancing peer associations (Thornberry 1987). Substantial evidence

indicates that peers engaged in sexual activity or nonsexual problem behavior may encourage early sexual behavior (Kinsman, Romer, Furstenberg, and Schwarz 1998;

Finally, we consider the role of a number of potentially consequential individual level risk factors for adolescent sexual activity identified in prior research. These include early pubertal maturation (Zabin, Hirsch, Smith, and Hardy 1984; Brooks-Gunn and Furstenberg 1989; Graber, Brooks-Gunn, and Galen 1998; Halpern, Udry, and Suchindran 1997; Stattin and Magnusson 1990), prior problem behavior (Elliott and Morse 1987; Jessor 1983; Weiher, Huizinga, Lizotte, and Kammen 1991), temperament (Capaldi, Crosby, and Stoolmiller 1996) and academic achievement (Halpern, Joyner, Udry, and Suchindran 2000; Hayes 1987; Hofferth 1987; Resnick et al. 1997).

In our multivariate analyses presented below, we consider the impact of both neighborhood structural characteristics and collective efficacy on the number of adolescent sexual partners (including racial differences in this outcome) in the context of extensive multivariate models that include these key family, peer, and individual level factors.

Data and Methods

We use multiple independent data sources gathered by the Project on Human Development in Chicago Neighborhoods (PHDCN) to examine individual, family, and neighborhood correlates of the number of sexual partners during early adolescence. The primary data sources used in the analyses are the PHDCN Longitudinal Cohort Study, the PHDCN Community Survey, and 1990 Census data.

DESIGN

For the Longitudinal Cohort Study, Chicago's 847 census tracts were combined into 343 neighborhood clusters (NCs). NCs were constructed in order to maximize population homogeneity with respect to racial/ethnic, socioeconomic, housing, and family structure characteristics (NCs average roughly 8,000 people).¹ NCs were bounded by identifying, where possible, ecologically meaningful borders such as railroad tracks and freeways. Next, a two-stage sampling procedure was employed that included selecting a random sample of 80 of the 343 Chicago Neighborhood Clusters (NCs) stratified by racial/ethnic composition (7 categories) and SES (high, medium, and low). The study design was constructed in order to capture an equal number of NCs in all 21 cells (varying by racial/ethnic composition and SES). This objective was well approximated with only 3 exceptions: low-income primarily European American, high-income primarily Latino, and high-income Latino/African American neighborhoods did not exist. Within these 80 NCs, children falling within 7 age cohorts (birth and ages: 3, 6, 9, 12, 15, & 18) were sampled from randomly selected households. Extensive in-home interviews and assessments were conducted with these children and their primary caregivers at two points in time over a 4-year period, at roughly 2-year intervals (Wave 1 in 1995-1996 and Wave 2 in 1998-1999). All individual and family measures are drawn from the PHDCN Longitudinal Cohort Study.

Neighborhood measures are constructed from the PHDCN Community Survey, as well as 1990 Census data. The Community Survey is a probability sample of 8,782

residents of Chicago emphasizing respondent evaluations of their communities. The Community Survey was conducted in 1994-1995, overlapping with the first wave of the Longitudinal Cohort Study. These samples were independently collected, however, minimizing problems of shared source bias that may afflict studies that employ neighborhood assessments from respondents who are also reporting on the dependent variable. The Community Survey used a three-stage sampling strategy: First, city blocks were randomly selected within each of the identified 343 NCs; second, dwelling units within blocks were randomly selected; and third, respondents (one adult, age 18 or over, per household) within dwelling units were randomly selected to complete surveys. The Community Survey sampling strategy achieved a sufficient within neighborhood N to estimate neighborhood characteristics based on aggregated individual level data.² The final response rate was 75%.

SAMPLE

This study uses Wave 1 data on subject and primary caregiver characteristics from the Longitudinal Cohort Study to predict the number of sexual partners among respondents between the ages of 12 and 17. Information on the number of sexual partners is drawn from the age 12 and 15 cohorts at Wave 2. The sample is roughly evenly split by sex of the adolescent and a range of socioeconomic groups is represented, by design ($N=952$, capturing 77 NCs). For the total sample of youth, 51% are girls and 49% are boys. The Chicago population in the middle of the 1990s was increasingly diverse, and the composition of the PHDCN LCS represents this heterogeneity. In the current sample,

47% are Latino, 34% are African American, 16% are European American, and 3% are from other racial groups (we combine the European American and other racial categories in the analyses below). Among Latinos, 68% are Mexican, 22% are Puerto Rican, and 10% are from “Other” Latino backgrounds. Sample retention across waves was 82%.

DEPENDENT VARIABLE

The dependent variable used in the analysis is a categorical measure of the reported total number of sexual partners at Wave 2. During the second wave of the Longitudinal Cohort Study, adolescents who reported that they had experienced sexual intercourse were asked, “Since you first had sexual intercourse, has it always been with the same person, or have you had sex with more than one person?”³ Respondents who reported having had sex with more than one person were then asked “How many different people have you had sex with?”⁴ For the sample as a whole, 79.3% reported no sexual partner in their lifetime, 10.1% reported one partner, and 10.6% reported two or more partners.⁵

INDEPENDENT VARIABLES

We include a variety of independent variables designed to measure key family, peer, and child characteristics as well as features of neighborhood environment. Table 1 reports descriptive statistics on variables included in the analysis.

Insert Table 1

about here

Child and Family Demographic Characteristics. Demographic characteristics include gender, age, race/ethnicity (two dummy codes indicating African-American and Latino, with European American/other [hereafter European American] serving as omitted referent), and immigrant generation (first: subject born outside of the US; second: at least one of subject's parents born outside the US; third or higher [omitted referent]: subject's grandparents or more distant relations born outside the US). Family level structural background measures include socioeconomic status (the first principal component of annual household income, education [highest education level achieved by primary caregiver in the household⁶], and occupation for the adolescent's primary caregiver).⁷ Family structure is captured by a dummy variable marking the presence of a biological mother and father in the household versus all other family arrangements. Household size is captured by the number of individuals in the household.

Family Processes. We include two multiple items scales: First, *family attachment and support* is comprised of five items tapping adolescents' agreement with the following statements: (a) "No matter what happens, I know that my family will always be there for me should I need them," (b) "My family lets me know they think I'm a worthwhile (valuable) person," (c) "People in my family have confidence in me," (d) "people in my family help me find solutions to my problems," and (e) "I know my family will always stand by me" (reliability = .75) (Turner, Frankel, and Levin 1987).

Second, *supervision* is a 24-item scale based on an expanded version of the supervision subscale of the Home Observation for Measurement of the Environment (HOME) (Bradley and Caldwell 1984; Bradley, Corwyn, Caldwell, Whiteside-Mansell, Wasserman, and Mink 2000). Items were based on primary caregiver reports and include dichotomous (yes/no) responses to questions asking whether, e.g., the subject has a set time [curfew] to be home on school nights, after school the subject goes somewhere that adult supervision is provided, and the subject is not allowed to wander in public places without adult supervision for more than two hours. The final measure is the empirical Bayes residual from a two-level Rasch model (reliability = .67).⁸

Peer Influences. We include a measure of *peer deviance* constructed from seventeen items asking adolescents to report on the behavior of people they “spend time with.” Questions asked about how many of these people engage in activities such as alcohol and drug use, property and violent crime, and “sexual intercourse.” Responses were given on a three-point scale (“none of them,” “some of them,” or “all of them”). The measure used in the analyses is the empirical Bayes residual from a multilevel ordinal logit (rating scale) analysis (reliability = .86).

Individual Risk Factors. We focus on developmental, behavioral, temperament, and academic risk factors for early sexual activity. Boys were asked whether they had experienced a height spurt, growth of body hair, any skin changes (such as pimples), voice deepening, and growth of facial hair (Responses were given on a four-point scale: “no,” “yes (barely),” “yes (definitely),” or “development completed”). The scale constitutes the sum of the item responses divided by the number of items (reliability =

.69). Girls were asked whether they had experienced a height spurt, growth of body hair, any skin changes (such as pimples), breast growth, and menstruation (reliability = .72) (Petersen, Crockett, Richards, and Boxer 1988).

Prior problem behavior was assessed by adolescents' reported participation (yes/no) in nineteen non-sexual activities involving violent behavior, property crime, and use of illegal drugs; items were combined using a multilevel Rasch model. The final scale used in analyses is the empirical Bayes residual from the level-two model (reliability = .75).

In addition, a subscale of the Emotionality and Sociability Inventory (EASI, Buss and Plomin 1984) was employed to assess sociability. This widely used inventory was administered to primary caregivers, who reported how characteristic each behavior was of their children (from "1" uncharacteristic to "5" characteristic). Sample items include "makes friends easily" and "likes to be with people." The scale constitutes the sum of the item responses divided by the number of items (reliability = .65). Reading achievement/competence was assessed by adolescents' performance on the reading component of the *Wide Range Achievement Test* (WRAT-3; (Wilkinson 1993)), which is a standardized test (mean = 100; standard deviation = 15) that evaluates reading achievement.

Neighborhood Characteristics. All neighborhood characteristics were derived for each of the 80 NCs (or neighborhoods) used in the analyses. Measures of neighborhood level structural characteristics were constructed using data from the 1990 Decennial census. Based on theory and extensive prior investigation (Land, McCall, and Cohen 1990; Sampson, Raudenbush, and Earls 1997), principal components analyses were

performed on selected census-based measures. First, *concentrated poverty* is the first principal component of the percent below the poverty line, percent receiving public assistance, percent unemployed, and the percent of households headed by a female. For analytic purposes, the natural log of this principal components scale score was used. Second, a *residential stability* component combines measures of continuity of residence (percent living in the same house as 1985) and the percent of housing occupied by owners. Third, an *immigrant concentration* component combines the percent Latino and percent foreign born.

Our measure of *collective efficacy* combines information from two scales administered as part of the Community Survey: First, a social cohesion scale was constructed from a cluster of conceptually related items measuring the respondent's level of agreement (on a five-point scale) with the following statements: (1) "People around here are willing to help their neighbors," (2) "This is a close-knit neighborhood," (3) "People in this neighborhood can be trusted," (4) "People in this neighborhood generally don't get along with each other," and (5) "People in this neighborhood do not share the same values." The latter two items were reverse coded.

Second, an intergenerational closure and informal social control scale was constructed from items tapping the respondent's level of agreement that (1) "Parents in this neighborhood know their children's friends," (2) "Adults in this neighborhood know who the local children are," (3) "There are adults in this neighborhood that children can look up to," (4) "Parents in this neighborhood generally know each other," and (5) "You can count on adults in this neighborhood to watch out that children are safe and don't get

in trouble.” By design, this scale captures aspects of both adult-child social ties as well as expectations for active support and informal social control of local youth by neighborhood adults (Sampson, Morenoff, and Earls 1999).

The two scales were highly correlated ($r > .65$) and were combined into a single measure of youth-related intergenerationally-oriented collective efficacy (hereafter “collective efficacy”). The measure of collective efficacy used in the analysis was constructed using a three-level linear item response model (Raudenbush and Bryk 2002; Sampson, Raudenbush, and Earls 1997). At level one, an item-response model adjusted individual level latent collective efficacy scores for missing data, taking into account the difficulty level of items for which a response was provided. At level two, neighborhood collective efficacy scores (intercepts in between-individual models) were adjusted for the social composition of Chicago neighborhoods through inclusion of controls for gender, age, race/ethnicity (Black, Hispanic vs. European American), education, employment status (employed vs. not employed), marital status (never married, separated or divorced vs. married), home ownership, years resident in the neighborhood, and number of moves in the last five years. At level three, adjusted neighborhood intercepts varied randomly around the neighborhood grand mean. The standardized neighborhood level empirical Bayes residual constitutes the collective efficacy score employed as an independent variable in subsequent analyses of the number of sexual partners. The three-level reliability of the combined scale was .81.⁹

Analytic Strategy

Tables 2 and 3 present the results of multinomial logit models with robust standard errors examining the determinants of the number of sexual partners during adolescence. As noted, the PHDCN data are hierarchically structured (individuals nested with neighborhoods). Within neighborhood correlation between cases may bias standard errors downward. We examined results from both multinomial logit models with robust standard errors and random effects multinomial logit models—findings were comparable.¹⁰

Our first set of multivariate analyses (Table 2) focuses on individual, family, and peer influences on adolescent sexual behavior. Models are clustered by category comparison (e.g., coefficients from three models showing the change in log odds of reporting one sexual partner vs. no partners associated with model covariates are grouped in the first three columns of the table). In Model 1, we examine the effects of race/ethnicity, age, immigrant generation, and sex on the log odds of reporting one vs. no sexual partners. We then add family background in Model 2 (SES, composition, size, supervision, and attachment) followed by peer influences and individual risk factors in Model 3 (peer deviance, pubertal development, prior problem behavior, sociability, and reading achievement).

The next set of models (Table 3) considers neighborhood measures. First, we include our key neighborhood structural characteristics—concentrated poverty (Model 1), residential stability, and immigrant concentration (Model 2)—to test whether these characteristics aid in the explanation of number of sexual partners over and above family,

peer, and individual characteristics. We then enter our measure of collective efficacy (Model 3) to consider its unique effects and the extent to which it mediates any observed neighborhood structural effects on the number of adolescent sexual partners. We omit individual level covariates in Table 3, with the exception of race/ethnicity (allowing for an assessment of the extent to which race/ethnic associations with the outcome variable are modified by the inclusion of neighborhood effects).

Results

We begin by considering multinomial logit models of the number of sexual partners including additional demographic, family, peer, and individual level covariates (Table 2). Focusing, first, on the contrast between one and no sexual partner, Model 1 indicates that age is positively associated with reporting a single sexual partner. Immigrant generation (both first and second vs. third or higher) negatively predicts having had one sexual partner. Of interest is the lack of association between race/ethnic indicators and the likelihood of having one vs. no sexual partner. The addition of family structural background and processes in Model 2 alters demographic associations minimally, but indicates that having two biological parents in the household and higher family attachment is negatively associated with reporting one sexual partner, while family size is positively associated with this outcome. Finally, Model 3 adds individual and peer variables, indicating that pubertal development is powerfully positively associated with reporting one sexual partner (not surprisingly, accounting for a proportion of the age effect) as are prior problem behavior and sociability.

Insert Table 2

about here

The second three columns of Table 2 report results for the contrast between having 2 or more sexual partners and no partner (unless otherwise noted, we distinguish the magnitudes of coefficients across contrasts when hypothesis tests indicate a significant difference ($p < .10$ —Wald tests)). Unlike the contrast for 1 vs. 0 partners, African American adolescents are roughly 3.4 times as likely as white/other race/ethnicity respondents to report two or more sexual partners. Latino adolescents, however, did not differ significantly from white/other adolescents. Boys are also substantially more likely to report multiple partners. Age, once again, was positively associated with reporting two or more partners. The effects of family structural background and processes on multiple sexual partner reports are comparable to those for 1 sexual partner in terms of the presence of two biological parents and stronger family attachment and support, suggesting the importance of these family level factors for the regulation of adolescent sexual activity. Of interest is the statistically significant negative effect of supervision on multiple sexual partnering among adolescents. Supervision appears more relevant for the control of higher risk sexual behavior. The effects of pubertal development and prior problem behavior on multiple sexual partnering (in Model 3) were comparable to those

for reports of one sexual partner. Peer deviance, however, becomes a marginally significant positive predictor of multiple sexual partnering while sociability is not. Of note is the resilience of the African American effect on the likelihood of having two or more sexual partners—individual, peer, and family effects did little to account for the racial difference in multiple sexual partner reports.

Table 3 reports the results of models including neighborhood level covariates to fully specified micro-level models (Model 3 of Table 2). Though individual and family level covariates were included in the models shown in Table 3, we do not present the coefficients for these determinants, with the exception of race/ethnicity dummy variables. Focusing on the contrast between 1 and no sexual partner, Model 1 includes logged concentrated poverty, residential stability, and immigrant concentration (linear and quadratic terms). Poverty is positively associated with reporting a single sexual partner; a one unit increase on the concentrated poverty scale increases the odds of reporting one vs. no sexual partner by over 50 percent. Although residential stability is not a significant predictor of having one sexual partner, immigrant concentration exhibited a nonlinear association with this outcome. The negative and significant effect of the immigrant concentration quadratic term is consistent with the hypothesis of a positive ethnic heterogeneity effect on adolescent sexual partner reports at low levels; however, at higher levels, ethnic enclaves may begin to form that cohere around more traditional orientations toward sexual behavior (consistent with a negative effect on sexual partner reports).

Model 2 adds collective efficacy at the neighborhood level. Although the coefficient for collective efficacy is negative, it does not achieve significance at the conventional level. This finding is consistent with prior research on the effect of collective efficacy on the transition to first sex (Browning, Leventhal, and Brooks-Gunn 2004). Residential stability becomes a marginally significant positive predictor of sexual partner reports in this model specification.

Insert Table 3
about here

The third and fourth columns of Table 3 report coefficients for the contrast between having 2 or more sexual partners vs. no partner. Model results are similar for the effects of neighborhood structural characteristics. In Model 1, concentrated poverty exerts a significant positive effect on the likelihood of multiple partners. A one unit increase in the concentrated poverty scale results in a roughly 70% increase in the odds of reporting multiple partners. Note also that the coefficient for African American race/ethnicity has declined by over 57 percent and is no longer significant at the conventional level. Residential stability is not associated with multiple sexual partners, but immigrant concentration exhibits a marginally significant negative quadratic effect on this outcome, consistent with the effect observed for the contrast between 1 and no sexual partner.

Finally, Model 2 includes collective efficacy and reveals a significant negative effect of this measure on the likelihood of multiple sexual partner reports. A one unit increase in neighborhood collective efficacy decreases the likelihood of reporting two or more sexual partners by 40 percent—a non trivial impact. This effect is significantly larger in magnitude than the coefficient for collective efficacy associated with the contrast between 1 and no sexual partner ($p < .10$). Moreover, the effect of concentrated poverty on the likelihood of multiple sexual partners decreases by some 35 percent, suggesting that the impact of concentrated poverty on having two or more adolescent sexual partners works, in part, through collective efficacy. We also examined the predicted probability of having two or more sexual partners at various levels of neighborhood collective efficacy based on Model 2 of Table 3 (holding other covariates at their sample means; Figure 1). Nearly 34 percent of adolescents in low collective efficacy neighborhoods (1.5 standard deviations below the mean) are expected to report two or more sexual partners. In contrast, only 11 percent of adolescents in high collective efficacy neighborhoods (1.5 standard deviations above the mean) are predicted to report two or more sexual partners.

Insert Figure 1

about here

Discussion

Research on the etiology of early sexual behavior is moving beyond the longstanding exclusive interest in family, peer, and individual factors to include consideration of the neighborhood contexts of adolescents' lives (Brooks-Gunn, Duncan, Klebanov, and Sealand 1993). We build on this research to develop and test a theory of the link between neighborhood context and adolescent sexual risk behavior, emphasizing the role of structural disadvantage and collective efficacy. In addition, we extend a model focused on the influence of neighborhood level disadvantage and collective efficacy to understanding neighborhood and racial differences in the number of sexual partnerships during adolescence. The prevalence of multiple sexual partnering has important policy implications: Sexual risk may become concentrated, affecting outcomes (including, critically, the spread of sexually transmitted diseases) of even those who do not themselves enter into serial or concurrent sexual relationships. Thus, explanation of variation in the total number of sexual partnerships captures a consequential, cumulative, and socially extensible dimension of sexual risk (Jemmott and Jemmott 1990).

Our analyses began by investigating the micro contextual determinants of the count of sexual partnerships during adolescence. Drawing on extant research, the contribution of family socioeconomic attributes, family processes, peer, and individual level characteristics to adolescent sexual risk was explored. Findings indicated that African American youth were at substantially higher risk of experiencing two or more sexual partnerships than were European American or Latino youth. Male gender and older age were also positive associated with increased numbers of sexual partners.

In addition to the baseline effects of age, sex, and race/ethnicity, we found that the presence of two biological parents and family attachment were negatively associated with the number of sexual partners during adolescence. However, counter to expectations, family socioeconomic status was not associated with adolescent sexual behavior. Other micro level determinants differed in their effects on sexual initiation versus the progression to two or more partners. Family size was positively associated with having had one partner, but was not significantly associated with multiple partnering. Family supervision, however, was negatively associated only with multiple partnering. Among individual level characteristics, pubertal development and prior problem behavior were positively associated with the transition to one and two or more sexual partners, consistent with expectations. In contrast, deviant peer group affiliation was associated only with the transition to two or more sexual partners. Finally, sociability and reading achievement were not significantly associated with adolescents' number of sexual partners.

Our principal concern focused on the independent impact of neighborhood characteristics on the number of sexual partners. Consistent with expectations, the introduction of the neighborhood concentrated poverty measure to models including individual, family, and peer effects revealed significant effects on reports of both one and two or more sexual partners. Residential stability exhibited marginally significant positive associations with multiple sexual partnering, inconsistent with the expectations of collective efficacy theory. Findings regarding residential stability, however, have been mixed in recent efforts to test collective efficacy theory (e.g., see Sampson, Raudenbush,

and Earls 1997), suggesting that stability may, in some instances, be capturing constrained mobility and associated disadvantage (Wilson 1996).

The effect of immigrant concentration, however, was consistent with both a collective efficacy theory expectation of a positive effect of ethnic heterogeneity on the number of partners at low levels of immigrant concentration as well as a negative enclave effect on sexual partnering at high levels. The potential for negative effects of ethnic heterogeneity may be offset by the increasing concentration of Latino immigrants in Chicago communities and corresponding cohesion around more traditional orientations toward sexual behavior. Indeed, this finding is consistent with the notion that high levels of Latino and foreign born presence may tap a broadly protective “enclave effect” relevant to a range of adolescent outcomes.

Collective efficacy theory emphasizes community level social organization as a key mediating factor in the link between neighborhood structural disadvantage and individual adolescent outcomes (Brooks-Gunn, Duncan, Klebanov, and Sealand 1993; Sampson 1997; Sampson, Raudenbush, and Earls 1997; Wilson 1996). Our investigation of this hypothesis with respect to the number of adolescent sexual partnerships yielded evidence in support of the claim that collective efficacy as represented by the joint influence of intergenerational closure, social cohesion, and expectations for adult protection and active support of local youth has important consequences in limiting risky sexual behavior. Our measure of collective efficacy exerted statistically significant negative effects on reporting two or more sexual partners, above and beyond individual level and

neighborhood structural controls. Indeed, collective efficacy accounted for a nontrivial proportion of the impact of concentrated poverty reports of two or more sexual partners.

These findings highlight the relevance of community-level social processes in understanding individual adolescent sexual risk behavior beyond sexual initiation. Specifically, collective efficacy plays a significant role in limiting higher risk behavior, particularly when that behavior may elicit a common proscriptive response. Collective efficacy may be effective in the regulation of adolescent multiple sexual partnering because community level norms regarding the age-inappropriateness of this behavior for adolescents are more likely to be consistent and powerful. Findings from previous research on the effect of collective efficacy on the timing of first intercourse have yielded evidence that collective efficacy delays first sex only when adolescents experience higher levels of exposure to neighborhood environments (Browning, Leventhal, and Brooks-Gunn 2005). Similarly, to the extent that multiple sexual partnering expands the network exposed to the behavior, stakeholders have, potentially, greater access to information through which to produce an informal social control response.

A final goal of this study was to examine whether racial differences in the number of adolescent sexual partners persisted after accounting for individual as well as neighborhood factors. African American youth had a substantially higher likelihood of reporting multiple sexual partnerships by comparison with European Americans and Latinos. However, we found no evidence of differences between Latinos and European Americans with respect to the number of sexual partners. Many investigations of racial differences in sexual and other forms of risk behavior have emphasized individual and

family level correlates of such behavior (Haveman and Wolfe 1994). Despite the statistical significance of a subset of micro contextual factors, they failed to explain the racial difference in the number of sexual partners. In contrast, neighborhood factors explained 57% of the racial difference in number of sexual partners (Model 2 of Table 3 versus Model 3 of Table 2). Together, these findings suggest that neighborhood residence plays a consequential role in explaining the racial disparity in number of sexual partnerships during adolescence.

A number of limitations to the analysis are worthy of note. First, the PHDCN is limited to the City of Chicago, complicating inferences to other populations. Second, neighborhood residence is not random, as families have some choice as to where they live. Some unmeasured characteristics may account for any observed neighborhood influences (Tienda 1991). Nevertheless, we observe neighborhood effects even after including a rich battery of micro level controls made available in the Project on Human Development in Chicago Neighborhoods data. Third, though our research represents a first step in considering the role of neighborhood social processes in limiting multiple sexual partnering, we are unable to examine the impact of neighborhood social processes on sexual behavior trajectories in detail (i.e., the process by which adolescent sexual behavior unfolds over time). Nevertheless, our results indicate that collective efficacy is relevant to patterns of sexual activity beyond sexual initiation, suggesting that further examination of the role of neighborhood social processes in shaping sexual behavior trajectories is warranted.

The findings in this study suggest the importance of collecting detailed information on the multiple social contexts to which adolescents are exposed. Emerging investigation of the role of school context in adolescent development, for instance, has been undertaken largely independently of research on neighborhood effects. The simultaneous assessment of neighborhood and school effects on adolescent outcomes may shed important light on persistent yet unexplained effects of these contexts when examined separately. Finally, adolescent lives unfold not only within the confines of families, neighborhoods, and schools, but larger structural contexts such as metropolitan areas and regions. Assessing variation in adolescent development at higher levels of analysis would facilitate the additional consideration of factors such as racial segregation, broader cultural formations, and the State in understanding the adolescent experience.

NOTES

* This research was conducted with the support of the National Institute of Child Health and Human Development R01 HD42405. The Project on Human Development in Chicago Neighborhoods was funded by the John D. and Catherine T. MacArthur Foundation, the National Institute of Justice, and the National Institute of Mental Health. The findings reported here do not necessarily represent the views of the funders of the Project on Human Development in Chicago Neighborhoods. We thank Stephen Raudenbush, Robert Sampson, Jeffrey Morenoff, Sean Reardon, Felton Earls, and Ruth Peterson, for their helpful comments.

¹ Respondents were given the following definition of “neighborhood:” “By neighborhood...we mean the area around where you live and around your house. It *may* include places you shop, religious or public institutions, or a local business district. It is the general area around your house where you might perform routine tasks, such as shopping, going to the park, or visiting with neighbors.”

² The overall within-neighborhood *n* averaged about 25. The 80 target NCs for the longitudinal study included oversamples resulting in an average of about 50 interviews per NC.

³ Questions related to sexual intercourse were prefaced with the following statement: “Sometimes people refer to sexual intercourse as ‘doing sex’, ‘having sex’, ‘making love’, or ‘going all the way’.”

⁴ An effort was made to protect confidentiality during gathering of sensitive information such as ensuring privacy and making youth aware of the fact that a Federal Certificate of

Confidentiality was obtained for the study, which made it illegal to disclose adolescents' responses to anyone, such as parents or school officials (the exception being if youth posed a potential threat to themselves or others).

⁵ The distribution ranged from 0 to 17. One respondent reported 50 sexual partners. We excluded this respondent from the final analyses, although including the respondent in the analyses resulted in negligible changes to the parameter estimates.

⁶ If the subject had two primary caregivers, the caregiver who had the highest education level was used.

⁷ Occupational prestige was based on a coding strategy developed by Nakao and Treas (1994) using the updated 1990 Census Occupational Classification System (see Obeidallah, et al. (2000) for a discussion of the PHDCN coding strategy with respect to occupational prestige).

⁸ We employ item response theory in the context of multilevel models to construct individual level scales when the number of items used to create the scale is large (increasingly the likelihood of missing data on component items). Item response models take into account item "severity" and, if necessary, frequency in generating person-level "ability" scores (Wright and Masters 1982). An additional advantage of the multilevel item response model is the capacity to adjust for missing data, obviating the need to drop entire cases if data are missing on any one item in the scale. Scale scores from multilevel item response models are person level empirical Bayes (EB) residuals. EB residuals regress scale scores toward the scale grand mean by a factor proportional to the unreliability with which they have been estimated.

⁹ See Raudenbush and Sampson (1999) for a discussion of reliability in three level models.

¹⁰ Multilevel multinomial logit models of the categorical number of sexual partners variable resulted in very high correlation between the intercept random effects ($r > .98$), complicating estimation of the model. We fit models alternately fixing one intercept to its adjusted mean. These models produced comparable results to those presented here. We present the multinomial logit models with robust standard errors as they produce more conservative standard error estimates than multilevel multinomial logit models of the number of sexual partners variable with only one randomly varying intercept (Raudenbush and Bryk 2002).

REFERENCES

- Albert, Bill, Sarah Brown, and Christine M. Flanigan. 2003. "14 and Younger: The Sexual Behavior of Young Adolescents." National Campaign to Prevent Teen Pregnancy, Washington, DC.
- Baumer, Eric P. and Scott J. South. 2001. "Community Effects on Youth Sexual Activity." *Journal of Marriage and the Family* 63:540-554.
- Bearman, Peter S. and Hannah Bruckner. 1999. "Peer Effects on Adolescent Girls' Sexual Debut and Pregnancy." National Campaign to Prevent Teen Pregnancy, Washington, D.C.
- Billy, John O.G., Karin L. Brewster, and William R. Grady. 1994. "Contextual Effects of the Sexual Behavior of Adolescent Women." *Journal of Marriage and the Family* 56:387-404.
- Bradley, Robert H. and Bettye M. Caldwell. 1984. *Home Observation for Measurement of the Home Environment (HOME)*. Little Rock, AR: University of Arkansas.
- Bradley, Robert H., Robert F. Corwyn, Bettye M. Caldwell, Leanne Whiteside-Mansell, Gail A. Wasserman, & Iris T. Mink 2000. "Measuring the Home Environments of Children in Early Adolescence." *Journal of Research on Adolescence* 10: 247-288.
- Brewster, Karin L. 1994a. "Neighborhood context and the transition to sexual activity among young black women." *Demography* 31(4): 603-614.
- . 1994b. "Racial differences in sexual activity among adolescent women: The role of neighborhood characteristics." *American Sociological Review* 59(1): 408-424.

- Brooks-Gunn, Jeanne, Greg J. Duncan, Pamela Kato Klebanov, and Naomi Sealand. 1993. "Do Neighborhoods Influence Child and Adolescent Development." *American Journal of Sociology* 99: 353-395.
- Brooks-Gunn, Jeanne and Frank F. Furstenberg Jr. 1989. "Adolescent Sexual Behavior." *American Psychologist* 44:249-257.
- Browning, Christopher R., Tama Leventhal, and Jeanne Brooks-Gunn. 2004. "Neighborhood Context and Racial Differences in Early Adolescent Sexual Activity." *Demography* 41(4): 697-720.
- Browning, Christopher R., Tama Leventhal, and Jeanne Brooks-Gunn. 2005. "Sexual Initiation During Early Adolescence: The Nexus of Parental and Community Control." *American Sociological Review* 70(5): 758-778.
- Bryk, Anthony S. and Stephen W. Raudenbush. 1992. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Newbury Park, N.J.: Sage.
- Buss, Arnold H. and Robert Plomin. 1984. *Temperament: Early developing personality traits*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Capaldi, Deborah M., Lynn Crosby, and Mike Stoolmiller. 1996. "Predicting the Timing of First Intercourse for At-Risk Adolescent Males." *Child Development* 67:344-359.
- Cheong, Yuk Fai and Stephen W. Raudenbush. 2000. "Measurement and Structural Models for Children's Problem Behaviors." *Psychological Methods* 5:477-495.
- Coleman, James S. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.

- Conger, Katherine J., Martha A. Rueter, and Rand D. Conger. 2000. "The role of economic pressure in the lives of parents and their adolescents: The Family Stress Model." Pp. 201-223 in *Negotiating adolescence in times of social change*, edited by L. J. Crockett and R. K. Silbereisen. New York: Cambridge University Press.
- Conger, Rand D., Xiaojia Ge, Glen H. Elder, Frederick O. Lorenz, and Ronald L. Simons. 1994. "Economic stress, coercive family process, and development problems of adolescents." *Child Development* 65:541-561.
- Dornbusch, Sanford M., J. Merrill Carlsmith, and Steven J. Bushwall. 1985. "Single Parents, Extended Households and the Control of Adolescents." *Child Development* 56:326-341.
- Duncan, Greg J. and Jeanne Brooks-Gunn. 1997. *Consequences of Growing Up Poor*. New York: Russell Sage Foundation Press.
- Elliott, Delbert S. and Barbara J. Morse. 1987. "Drug Use, Delinquency, and Sexual Activity." in *Drug Abuse and Adolescent Sexual Activity, Pregnancy, and Parenthood*, edited by C. Jones and E. McAnarney. Washington, D.C.: 32-60. NIDA U. S. Government Printing Office.
- Flewelling, Robert L. and Karl E. Baumann. 1990. "Family Structure as a Predictor of Initial Substance Use and Sexual Intercourse in Early Adolescence." *Journal of Marriage and the Family* 52:171-181.

- Gorman-Smith, Deborah, Patrick H. Tolan, and David B. Henry. 2000. "A Developmental-Ecological Model of the Relation of Family Functioning to Patterns of Delinquency." *Journal of Quantitative Criminology* 16:169-198.
- Graber, Julia A., Jeanne Brooks-Gunn, and Britt R. Galen. 1998. "Betwixt and Between: Sexuality in the Context of Adolescent Transitions." Pp. 270-316 in *New Perspectives on Adolescent Risk Behavior*, edited by R. Jessor. New York: Cambridge University Press.
- Halpern, Carolyn T., Kara Joyner, Richard J. Udry, and Chirayath Suchindran. 2000. "Smart Teens Don't Have Sex (or Kiss Much Either)." *Journal of Adolescent Health* 26:213-25.
- Halpern, Carolyn T., Richard J. Udry, and Chirayath Suchindran. 1997. "Testosterone Predicts Initiation of Coitus in Adolescent Females." *Psychosomatic Medicine* 59:159-171.
- Haveman, Robert and Barbara Wolfe. 1994. *Succeeding Generations: On the Effects of Investments in Children*. New York: Russell Sage Foundation.
- Hayes, Cheryl D. 1987. "Risking the Future: Adolescent Sexuality, Pregnancy, and Childrearing." National Academy Press, Washington, D.C.
- Hofferth, Sandra L. 1987. "Factors Affecting Initiation of Sexual Intercourse." Pp. 7-35 in *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing*, vol. 2, edited by S. L. Hofferth and C. D. Hayes. Washington, DC: National Academy Press.

- Jemmott, Loretta Sweet and John B. Jemmott III. 1990. "Sexual Knowledge, Attitudes, and Risky Sexual Behavior Among Inner-City Black Male Adolescents." *Journal of Adolescent Research* 5:346-369.
- Jencks, Christopher and Susan E. Mayer. 1990. "The Social Consequences of Growing Up in a Poor Neighborhood." Pp. 111-186 in *Inner-City Poverty in the United States*, edited by J. L. E. Lynn and M. G. H. McGeary. Washington, D.C.: National Academy Press.
- Jessor, Richard, Mark S. Turbin, and Frances M. Costa. 1998. "Protective factors in adolescent health behavior." *Journal of Personality and Social Psychology* 75:788-800.
- Jessor, Richard, Frances M. Costa, Lee Jessor, and John E. Donovan. 1983. "Time of First Intercourse: A Prospective Study." *Journal of Personality and Social Psychology* 44:608-626.
- Keating, Daniel P. 1990. "Adolescent thinking." Pp. 54-59 in *At the Threshold: The Developing Adolescent*, edited by S. S. Feldman & G. R. Elliott. Cambridge, MA: Harvard University Press.
- Kinsman, Sara B., Daniel Romer, Frank F. Furstenberg Jr., and Donald F. Schwarz. 1998. "Early Sexual Initiation: The Role of Peer Norms." *Pediatrics* 102:1185-1192.
- Krivo, Lauren J. and Ruth D. Peterson. 1996. "Extremely Disadvantaged Neighborhoods and Urban Crime." *Social Forces* 75:619-650.

- Ku, Leighton, Freya L. Sonenstein, and Joseph H. Pleck. 1993. "Neighborhood, Family, and Work: Influences on the Premarital Behaviors of Adolescent Males." *Social Forces* 72:479-503.
- Land, Kenneth , Patricia L. McCall, and Lawrence E. Cohen. 1990. "Structural Covariates of Homicide Rates: Are There Any Invariances Across Time and Space." *American Journal of Sociology* 95:922-963.
- Lauritsen, Janet L. 1994. "Explaining Race and Gender Differences in Adolescent Sexual Behavior." *Social Forces* 72:859-884.
- Leventhal, Tama and Jeanne Brooks-Gunn. 2000. "The Neighborhoods they Live in: Effects of Neighborhood Residence on Child and Adolescent Outcomes." *Psychological Bulletin* 126:309-337.
- Massey, Douglas S. and Nancy A. Denton. 1993. *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.
- McLanahan, Sara and Gary Sandefur. 1994. *Growing up with a single parent: What hurts and what helps*. Cambridge, MA: Harvard University Press.
- McLoyd, Vonnie C. and Leon Wilson. 1990. "Economic stress: Effects on family life and child development." Pp. 50-69 in *New directions for child development*, edited by W. Damon. San Francisco, CA: Jossey-Bass.
- Meier, Ann. 2004. "Adolescent Sexual Activity and Mental Health." Working paper. Department of Sociology, University of Minnesota, Minneapolis, MN.
- Nakao, Keiko and Judith Treas. 1994. "Updating Occupational Prestige and Socioeconomic Scores: How the New Measures Measure Up." Pp 1-72 in

- Sociological Methodology*, edited by P. Marsden. Washington DC: American Sociological Association.
- Obeidallah, Dawn A., Robert T. Brennan, Jeanne Brooks-Gunn, Daniel Kindlon, and Felton Earls. 2000. "Socioeconomic Status, Race, Girls' Pubertal Maturation: Results from the Project on Human Development in Chicago Neighborhoods." *Journal of Research on Adolescence* 10(4): 443-464.
- Osgood, D. Wayne. 1988. "The Generality of Deviance in Late Adolescence and Early Adulthood." *American Sociological Review* 53:81-93.
- Petersen, Anne C., Lisa J. Crockett, Maryse H. Richards, and Andrew M. Boxer. 1988. "A Self-Report Measure of Pubertal Status: Reliability, Validity, and Initial Norms." *Journal of Youth and Adolescence* 17:117-133.
- Portes, Alejandro. 1998. "Social Capital: Its Origins and Applications in Modern Sociology." *Annual Review of Sociology* 24:1-24.
- Ramirez-Valles, Jesus, Marc A. Zimmerman, and Michael D. Newcomb. 1998. "Sexual risk behavior among youth: Modeling the influence of prosocial activities and socioeconomic factors." *Journal of Health and Social Behavior* 39(3):237-253.
- Ramirez-Valles, Jesus, Marc A. Zimmerman, and Lucia Juarez. 2002. "Gender differences of neighborhood and social control process: A study of the timing of first intercourse among low-achieving, urban, African American Youth." *Youth and Society* 33:418-441.

- Raudenbush, Stephen W. and Robert J. Sampson. 1999. "'Ecometrics': Toward a Science of Assessing Ecological Settings, with Application to the Systematic Social Observation of Neighborhoods." *Sociological Methodology* 29:1-41.
- Raudenbush, Stephen W. and Anthony S. Bryk. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*. Newbury Park, NJ.
- Resnick, Michael D., Peter S. Bearman, Robert W. Blum, Karl E. Bauman, Kathleen M. Harris, Jo Jones, Joyce Tabor, Trish Beuhring, Renee E. Sieving, Marcia Shew, Majorie Ireland, Linda H. Bearinger, and Richard J. Udry. 1997. "Protecting Adolescents From Harm: Findings from the National Longitudinal Study on Adolescent Health." *Journal of the American Medical Association* 278:823-32.
- Sampson, Robert J. 1997. "The Embeddedness of Child and Adolescent Development: A Community-Level Perspective on Urban Violence." Pp. 31-77 in *Violence and Childhood in the Inner City*, edited by J. McCord. Cambridge: Cambridge University Press.
- Sampson, Robert J., Jeffrey D. Morenoff, and Felton Earls. 1999. "Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children." *American Sociological Review* 64:633-660.
- Sampson, Robert J., Jeffrey D. Morenoff, and Thomas Gannon-Rowley. 2002. "Assessing Neighborhood Effects: Social Processes and New Directions in Research." *Annual Review of Sociology* 28:443-478.

- Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls. 1997. "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 227:918-923.
- South, Scott J. and Eric Baumer. 2000. "Deciphering Community and Race Effects on Adolescent Premarital Childbearing." *Social Forces* 78:1379-1408.
- Stattin, Hakan and David Magnusson. 1990. *Paths Through Life: Vol 2. Pubertal Maturation in Female Development*. Hillsdale, NJ: Erlbaum.
- Thornberry, Terence P. 1987. "Toward an Interactional Theory of Delinquency." *Criminology* 25:863-891.
- Tienda, Marta. 1991. "Poor people and poor places: Deciphering neighborhood effects on poverty outcomes." Pp. 244-262 in *Macro-micro linkages in sociology*, edited by J. Huber. Newbury Park, CA: Sage Publications.
- Tubman, Jonathan G., Michael Windle, and Rebecca C. Windle. 1996. "Cumulative Sexual Intercourse Patterns Among Middle Adolescents: Problem Behavior Precursors and Concurrent Health Risk Behaviors." *Journal of Adolescent Health* 18:182-191.
- Turner, R. Jay, B. Gail Frankel, and Deborah M. Levin. 1987. "Social Support: Conceptualization, Measurement, and Implications for Mental Health." *Research in Community and Mental Health* 3:67-111.
- Upchurch, Dawn M., Carol S. Aneshensel, Clea A. Sucoff, and Lene Levy-Storms. 1999. "Neighborhood and Family Contexts of Adolescent Sexual Activity." *Journal of Marriage and the Family* 61:920-933.

- Weiher, Anne Wylie, David Huizinga, Alan J. Lizotte, and Welmoet B. Van Kammen. 1991. "The Relationship between Sexual Activity, Pregnancy, Delinquency, and Drug Abuse." in *Urban Delinquency and Substance Abuse: A Technical Report*, edited by David Huizinga, Rolf Loeber, and Terence Thornberry. Washington, D.C.: Office of Juvenile Justice and Delinquency Prevention.
- Whitaker, Daniel J., Kim S. Miller, and Leslie F. Clark. 2000. "Reconceptualizing Adolescent Sexual Behavior: Beyond Did They or Didn't They?" *Family Planning Perspectives* 32:111-117.
- Wilkinson, G. 1993. *WRAT-3: Wide Range Achievement Test, Administration Manual*. Wilmington, DE: Wide Range, Inc.
- Wilson, William J. 1996. *When Work Disappears*. New York: Alfred A. Knopf.
- Wright, B.D. and G.N. Masters. 1982. *Rating Scale Analysis*. Chicago: MESA.
- Wu, Lawrence L. and Elizabeth Thomson. 2001. "Race Differences in Family Experience and Early Sexual Initiation: Dynamic Models of Family Structure and Family Change." *Journal of Marriage and the Family* 63:682-696.
- Zabin, Laurie S., Marilyn B. Hirsch, Edward Smith, and Janet B. Hardy. 1984. "Adolescent Sexual Attitudes and Behavior: Are They Consistent?" *Family Planning Perspectives* 16:181-185.

Table 1. Descriptive Statistics for Variables in the Analysis*

Independent Variables	Mean/Pct.	Std. Dev.	Min.	Max.
<i>Demographic and family background</i>				
Race/ethnicity				
African American	33.7%	-	0	1
Latino	47.0%	-	0	1
White/other	19.3%	-	0	1
Male	49.1%	-	0	1
Age (Wave 1)	12.898	1.552	10	15
Age (Wave 2)	14.836	1.546	12	17
Immigrant generation				
First	14.3%	-	0	1
Second	31.6%	-	0	1
Third or higher	54.1%	-	0	1
Family socioeconomic status	-.109	1.455	-2.985	3.523
Two biological parents	47.4%	-	0	1
Family size	5.259	1.947	2	14
Family attachment and support	1.221	.312	1	3
Supervision	.060	.668	-2.781	.956
<i>Peers</i>				
Peer deviance	-.310	1.315	-2.807	3.932
<i>Individual characteristics</i>				
Pubertal development	2.353	.585	1	4
Prior problem behavior	-.189	1.012	-1.127	3.510
Sociability	3.662	.778	1	5
Reading achievement [†]	98.202	18.373	44	145
<i>Neighborhood characteristics</i>				
Concentrated poverty	-.002	.850	-3.074	1.506
Residential stability	-.143	.985	-1.631	2.230
Immigrant concentration	.451	1.038	-1.053	2.822
Collective efficacy	.047	.998	-2.339	3.090

* *N* = 952 for individual, peer, and family level variables; *N* = 77 for neighborhood characteristics.

Table 2. Multinomial Logit Models of the Number of Sexual Partners during Adolescence (0, 1, 2 or more)^a

Independent Variables	Model (1 vs. 0 partners)			Model (2 or more vs. 0 partners)		
	1	2	3	1	2	3
Race/ethnicity						
African american	.328 (.320)	.010 (.383)	.044 (.369)	1.222 *** (.316)	1.105 ** (.360)	1.155 ** (.389)
Latino	.094 (.341)	-.019 (.389)	.058 (.374)	-.154 (.389)	-.102 (.448)	-.031 (.465)
Age	.649 *** (.067)	.651 *** (.071)	.469 *** (.083)	.900 *** (.074)	.887 *** (.079)	.679 *** (.092)
Immigrant generation (vs. third)						
First	-1.171 *** (.311)	-1.142 ** (.380)	-.954 * (.377)	-.588 (.428)	-.522 (.442)	.089 (.493)
Second	-.900 ** (.265)	-.888 ** (.278)	-.876 ** (.287)	-.064 (.346)	-.073 (.344)	.114 (.392)
Male	-.007 (.203)	.106 (.202)	.538 * (.261)	1.177 *** (.219)	1.322 *** (.221)	1.572 *** (.232)
Family socioeconomic status	-	.010 (.110)	.009 (.113)	-	-.009 (.092)	.002 (.106)
Two biological parents	-	-.799 ** (.300)	-.842 ** (.321)	-	-.872 ** (.286)	-.756 * (.313)
Family size	-	.110 * (.044)	.122 * (.050)	-	.018 (.071)	.011 (.075)
Supervision	-	-.003 (.183)	.033 (.193)	-	-.465 ** (.171)	-.327 + (.187)
Family attachment and support	-	-1.115 ** (.342)	-.978 ** (.345)	-	-1.056 ** (.332)	-.653 + (.360)
Peer deviance	-	-	.031 (.079)	-	-	.166 + (.095)
Pubertal development	-	-	.941 *** (.240)	-	-	.715 *** (.199)
Prior problem behavior	-	-	.321 ** (.115)	-	-	.756 *** (.121)
Sociability	-	-	.337 * (.162)	-	-	.220 (.150)
Reading achievement	-	-	-.001 (.008)	-	-	-.009 (.010)
Intercept	-11.238 *** (1.056)	-12.796 *** (1.212)	-13.575 *** (1.853)	-16.269 ** (1.253)	-17.247 *** (1.414)	-15.703 *** (1.850)

^aNeighborhood level $N = 77$; Person level $N = 952$.+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$ (two-tailed tests). Standard errors in parentheses.

Table 3. Multinomial Logit Models of the Number of Sexual Partners during Adolescence (Including Neighborhood Characteristics)^a

Independent Variables	Model (0 vs. 1 p)		Model (0 vs. 2 or more ps)	
	1	2	1	2
<i>Race/ethnicity</i>				
African american	-.361 (.413)	-.444 (.439)	.491 (.472)	.444 (.419)
Latino	.037 (.392)	.062 (.392)	-.101 (.564)	.026 (.509)
<i>Neighborhood characteristics</i>				
Concentrated poverty	.432 ** (.157)	.401 ** (.154)	.539 * (.256)	.352 + (.208)
Residential stability	.251 (.161)	.326 + (.169)	.098 (.187)	.276 + (.164)
Immigrant concentration	.093 (.240)	.048 (.255)	-.127 (.254)	-.222 (.224)
Immigrant concentration squared	-.343 ** (.119)	-.345 ** (.121)	-.241 + (.137)	-.236 + (.141)
Collective efficacy	-	-.154 (.150)	-	-.510 ** (.166)
Intercept	-13.542 *** (1.910)	-13.510 *** (1.915)	-15.907 *** (1.879)	-15.667 *** (1.860)

Note: Models control for all individual and family level characteristics included in Model 3 of Table 2 (in addition to race/ethnicity).

^aNeighborhood level $N = 77$; Person level $N = 952$.

+ $p < .10$ * $p < .05$ ** $p < .01$ *** $p < .001$ (two-tailed tests). Standard errors in parentheses.

Figure 1. Predicted Probability of Reporting Two or More Sexual Partners by Age 17 for Selected Levels of Neighborhood Collective Efficacy

