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CONTEXTUALIZING THE INTERSECTIONS OF STRUCTURAL INEQUALITY: A NEIGHBORHOOD-CENTERED APPROACH TO PLACE

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ABSTRACT

Characteristics of neighborhood context (particularly poverty/disadvantage) are important correlates of adolescent health and well-being. Given youths' limited geographic mobility, neighborhoods are a critical developmental context to which youth are exposed. Traditional approaches for studying neighborhood effects focus on disadvantage, using single indicators or multi-item indices of disadvantage. However, processes of racial/ethnic segregation and socioeconomic stratification produce a more complex patterning of neighborhood "types" or "profiles." While past research frequently refers to specific neighborhood types (e.g., Black middle-class, urban underclass, Hispanic enclaves, affluent), the measures typically used by quantitative studies do not match these categorizations, or allow the full complexity of neighborhood types to emerge from the data. The current study brings neighborhoods to the forefront, using cluster analysis to identify specific neighborhood types patterned by the intersection of three multidimensional components of neighborhoods: racial/ethnic composition, class (socioeconomic status), and urbanicity/rurality. We then illustrate the utility of this methodology by examining differences in three adolescent risk behaviors (exposure to violence, sexual activity, and cigarette smoking) across neighborhood types. [167 words]

Scholars have firmly established neighborhoods as an important life course context of health and well-being. Because many youth have limited geographic mobility, neighborhoods are a particularly important context in which adolescent development is embedded and unfolds (Bronfenbrenner 1989; Arnett 2000; Elliott, Menard, Rankin et al. 2006), and one with enduring social and economic consequences (Sharkey 2008). There is a large body of sociological research—across a number of specializations (e.g., health/medical sociology, education, crime/deviance, child development, urban sociology)—demonstrating the link between neighborhood compositional[1] characteristics (particularly poverty) and various outcomes such as physical and mental health, delinquency and violence, substance use, sexual debut and partnering, infectious disease transmission, teenage child-bearing, academic achievement, and high school dropout (for reviews, see Jencks and Mayer 1990; Leventhal and Brooks-Gunn 2000).

Much research on neighborhood effects focuses on the intervening mechanisms—both positive (e.g., networks, social capital, social control/cohesion, collective efficacy) and negative (e.g., disorder/disorganization, concentrated poverty, residential segregation)—through which structural forces exert their influence. However, given the geographic correlation between status hierarchies, social problems, and social/structural inequality (Ferraro et al. 2009), we argue that it is important to reassess how research *captures* neighborhood compositional and social structural characteristics as meaningful contexts. Here we focus on multiple dimensions

[1] There is some conflict in the terminology used by neighborhood effects researchers and life course researchers. In neighborhood research, the term "structure" is often used to refer to sociodemographic compositional characteristics (e.g., racial/ethnic composition, median income, poverty rate, etc.) (Jencks and Mayer 1990). In life course research, "structure" is used to refer to social structure more broadly—what neighborhood effects researchers (e.g., Aber, Gephart, Brooks-Gunn, and Connell 1997) refer to as "exogenous factors" shaping the patterning of particular sociodemographic characteristics, as well as opportunities and constraints. For clarity and consistency, we use the term "composition" when referring to sociodemographic neighborhood characteristics and "structure" when referring to larger macro-level forces and social institutions/systems (Elder, Johnson, and Crosnoe 2003; Settersten and Gannon 2005; Ferraro, Shippee, and Schafer 2009).

characterizing neighborhoods as contextual settings in which individual outcomes are embedded, and in which the oft studied intervening mechanisms operate. It has been over a decade since Robert (1999) noted the need for better specification of the basic relationship between neighborhood context and individual outcomes, and we believe this need remains. This paper explores an alternative method for thinking about and measuring neighborhood context in order to provide a more thorough portrait of how neighborhoods reflect the structural inequality shaping individuals' exposure to risks and access to resources, opportunities, and various forms of capital (human, social, and cultural), all of which shape life course outcomes (see, O'Rand 2001 for a discussion of stratification and the life course). Inequality is systematically structured on multiple levels (Ferraro et al. 2009), and may be most apparent in the physical environments of neighborhoods (Spencer, McDermott, Burton, and Kochman 1997), which themselves reflect the larger societal forces acting to stratify groups by race/ethnicity and social class (Earls and Carlson 2001).

One common approach to capturing neighborhood context is using multiple individual items or indices of neighborhood characteristics—an approach we term "variable-centered." A limitation of this approach is that it treats compositional characteristics as if they are completely independent, ignoring their intersections (Choo and Ferree 2010). Processes of racial/ethnic segregation and socioeconomic stratification have produced a complex patterning of neighborhoods defined by "types" or "profiles" of characteristics (Upchurch, Aneshensel, Sucoff, and Levy-Storms 1999). While past research often discusses specific neighborhood types, such as those occupied by the Black urban underclass (Wilson 1987), Black middle-class (Pattillo 2005), affluent Whites (Lee and Marlay 2007) or Hispanic immigrants (Logan, Zhang, and Alba 2002), quantitative studies have not adequately captured these distinct social,

structural, and developmental contexts.

To address this limitation and extend existing scholarship examining neighborhoods as key life course contexts, the current study employs what we term a "neighborhood-centered" approach, identifying specific neighborhood types patterned by the intersection of three compositional components of neighborhoods: racial/ethnic composition, socioeconomic class, and urbanicity/rurality. Much like a person-centered analytic approach to identifying groups of persons who share similar attributes or relationships among attributes (Cairns, Bergman, and Kagan 1998), a neighborhood-centered approach—using cluster analysis[2]—puts neighborhoods front and center. This approach provides more nuanced and substantive distinctions—often missing from neighborhood effects research—by highlighting how indicators of structural inequality intersect to create distinct neighborhood environments that are qualitatively different than the mere sum of these measures. We address what Dannefer and Kelley-Moore (2009) identify as a limitation in life course research—failure to acknowledge the unique role of social structure in the constitution of individual lives. By bringing a spatial inequality perspective (Lobao, Hooks, and Tickamyer 2007) to neighborhood effects research, we consider how individuals are jointly and simultaneously located in both geographic and social spaces, with implications associated with both types of locations. After identifying neighborhood types, we illustrate the utility of a neighborhood-centered approach by exploring how three adolescent risk behaviors (exposure to violence, sexual activity, and cigarette smoking) differ across these multidimensional neighborhood contexts.

[2] Previous research has utilized cluster analysis in two ways. One strategy groups geographically contiguous tracts into larger, homogenous neighborhood "clusters" to examine the effect of specific neighborhood characteristics (e.g., disadvantage, residential instability) on individual outcomes, often in a multi-level framework (e.g., Sampson, Raudenbush, and Earls 1997; Simons, Simons, Harbin Burt et al. 2005), and to combat issues of data sparseness in multi-level research (Clarke and Wheaton 2007). A second strategy, employed here, uses cluster analysis to capture patterns among constellations of neighborhood characteristics, classifying them into particular latent types of neighborhoods (e.g., Aneshensel and Sucoff 1996; Upchurch et al. 1999; Gorman-Smith, Tolan, and Henry 2000). This latter approach focuses more on social patterns in contextual data than on neighborhoods' spatial location.

BACKGROUND

Across the studies that link neighborhood context with various problem behaviors and health-related outcomes, neighborhood has been defined in a myriad of ways, with the majority of "neighborhood effects" research focusing on the consequences of neighborhood poverty, which is positively associated with youth violence (Haynie, Silver, and Teasdale 2006), sexual debut (Upchurch et al. 1999) and teenage pregnancy (South and Baumer 2000), and is detrimental for adolescents' mental health (Aneshensel and Sucoff 1996). However, the effect of neighborhood poverty on other outcomes, such as less severe forms of delinquency, substance use, and academic achievement, appears less clear (Wilcox 2003; Fauth, Leventhal, and Brooks-Gunn 2007; Snedker, Herting, and Walton 2009). The sometimes complex and contradictory findings of past studies leave us with questions regarding how neighborhoods "work," for what outcomes/social processes they are important, and if their effects differ across groups of people and types of places

Neighborhoods and the Life Course: Contexts for Development

The life course approach to studying human lives addresses the interplay between macro-social influences and individual-level biographies (Elder 1994). Two life course principles—time and place; human agency—are particularly applicable to neighborhood effects research. The principle of time and place recognizes the life course as embedded in and shaped by the times and places individuals experience over their lives, where place can represent various contexts, from nations to neighborhoods, with implications for persons' exposure to life course risks and resources. The principle of human agency recognizes that agency operates within structural constraints (Elder et al. 2003; Settersten and Gannon 2005). Thus, youths' decision-making is influenced by the opportunity structure available to them; their options are constrained by the

social and economic conditions they experience and by the limitations they perceive regardless of the accuracy of those perceptions (Galster and Killen 1995). Neighborhood factors such as school quality, crime, availability of health care and other services, and even environmental conditions (e.g., pollution, toxins) impact health and well-being in childhood, and, given their role as "geographies of opportunity" (Galster and Killen 1995; Briggs 2005), neighborhoods have effects and implications for socioeconomic mobility (e.g., education and income attainment) across the life course (Johnson 2011). Traditional markers of social stratification (race/ethnicity and class) vary spatially, with geography itself now having become a marker of stratification and inequality (Lobao 2004).

Dimensions of Spatial and Structural Inequality: Race/Ethnicity, Class, and Urbanicity

Much neighborhood effects research has focused on capturing the compositional characteristics of (urban) neighborhoods, which are segregated primarily in terms of socioeconomic class and racial/ethnic composition. This segregation is consistent with Blau's (1977) assertion that social structure represents processes of social differentiation on the individual level reflected at the aggregate level—that is, neighborhood composition reflects the confluence of structural forces. Neighborhoods affect health and well-being by shaping individuals' socioeconomic position through the differential provision of opportunities [or constraints] for education, employment, income, and other social and medical resources (Robert 1999; Earls and Carlson 2001). This is important because, as Robert (1999) notes, while empirical studies may find the independent effects of neighborhood context to be rather small in magnitude, the overall importance of neighborhoods may be more substantial given how neighborhood contexts shape residents' life chances.

Neighborhood Race/Ethnicity and Neighborhood Socioeconomic Class. Traditional approaches for studying neighborhood context often focus only on disadvantage, using single indicators—such as poverty rate or median income—or multi-item indices that combine several indicators of neighborhood socioeconomic status and racial/ethnic composition. Simply controlling for neighborhood poverty may underestimate the extent to which neighborhoods represent different "ecological niches" or contexts for development with respect to the distribution of risks and resources (Wilson 1987:60; Shinn and Toohey 2003:448). Another noted limitation is that past studies have inadequately considered the effects of concentrated affluence and the human capital resources of neighborhoods beyond emphases on income, poverty, and welfare (Massey 2001; Lee and Marlay 2007). Further, many neighborhoods exist at various points on a continuum between these two extremes of disadvantage and advantage, and are thus not captured in traditional measurement approaches (see, for example Crane 1991). Ferraro and colleagues (2009), on the other hand, argue that disadvantage and advantage are not simply inversely related, but rather that the accumulation of disadvantage has a greater impact on individuals than the accumulation of advantage. Other research (e.g., Massey, Rothwell, and Domina 2009) suggests that the educational stratification of neighborhoods is of growing importance. These points all speak to the importance of differentiating advantage from disadvantage.

Neighborhoods are racially/ethnically segregated and economically stratified (Aneshensel and Sucoff 1996). Race/ethnicity and class often covary, and neighborhood effects research tends to discuss their effects in tandem (Sucoff and Upchurch 1998:573), with the percentage of Black residents in an area often used as an indicator of socioeconomic disadvantage, or combined with other measures such as the poverty rate, due to the high correlation among these measures (Land,

McCall, and Cohen 1990). While neighborhood racial/ethnic composition and class are highly correlated, they are not equivalent. Thus combining these items may result in underestimation or misspecification of neighborhoods' actual importance (Jencks and Mayer 1990:125), which may help explain why past studies tend to show that neighborhoods exert small and/or inconsistent effects (see also, Rapkin and Luke 1993).

Recent research on residential segregation suggests that the *intersection* between race/ethnicity and class is becoming increasingly important for the structuring of spatial inequality (Massey et al. 2009; Dwyer 2010). Disadvantaged Black Americans live in neighborhoods with substantially lower incomes than the poorest White Americans (Wilson 1987), and even the meaning and life course consequences of a "middle class" neighborhood differ across racial and ethnic groups (Pattillo 2005; Sharkey 2008). There is also evidence that the correlation between race/ethnicity and class may be loosening, at least in terms of the growing Black middle class, who are more likely than poor Black Americans to live in slightly less segregated areas (Iceland, Sharpe, and Steinmetz 2005). As such, it is important to avoid conflating race/ethnicity and class by simply combining the measures into a single scale, neglecting the role both characteristics play in distinguishing neighborhood contexts (Gross and McDermott 2008:162). Rather, it may be more useful to explore neighborhoods in a way that embraces the covariation between race/ethnicity and class, and the ways in which they intersect to (re)produce inequality jointly and simultaneously (Choo and Ferree 2010).

Finally, while much of the literature has focused on Black-White differences in neighborhood contexts, it is also important to consider the effect of Hispanics or other racial/ethnic minorities in the neighborhood, particularly given the increasing Hispanic population (Ramirez 2004), and the trend among both Hispanic and Asian households to locate

in more suburban areas (Clark 2006; Iceland and Nelson 2008). Hispanics generally are less segregated from Whites than are Blacks (Alba, Denton, Leung, and Logan 1995) and Asians experience particularly low segregation (Massey and Fischer 2001). Further, the presence of Black and Hispanic neighbors has differential implications for residents. For instance, residents associate the presence of Black (more so than Hispanic) neighbors with neighborhood social disorder and disorganization (Schulz, Zenk, Israel et al. 2008). Thus it is important to consider further how race/ethnicity and class intersect to shape neighborhood contexts, and also how neighborhood effects may vary across geographic settings and racial/ethnic groups.

Neighborhood Setting: Urbanicity, Suburbanicity, and Rurality. The term "neighborhood effects" is not often applied to discussions of non-urban areas and their residents. A majority of research has focused on isolation and concentrated disadvantage in Chicago neighborhoods (e.g., Morenoff and Sampson 1997; Sampson, Morenoff, and Gannon-Rowley 2002), or other metropolitan areas (Campbell and Lee 1992; Warner and Rountree 1997). Such a narrow focus is insufficient for understanding fully the ways in which structural inequality plays out across types of places, and for recognizing the disadvantages contained in any place that is plagued by risks and poor in opportunities (Tickameyer and Duncan 1990; Lobao and Hooks 2007). Further, the concept of neighborhoods as "geographies of opportunity"—social systems, markets, and institutions with differing resources with consequences for the social and economic mobility of Americans (Galster and Killen 1995; Briggs 2005)—is not an exclusively metropolitan phenomenon (e.g., Tickameyer and Duncan 1990; Lobao 2004).

There is the assumption (e.g., Geis and Ross 1998) that non-urban[3] places (suburbs,

[3] While the terms "rural" and "non-metropolitan" are often used interchangeably, they differ in their Census operationalization. In 1990, the Census Bureau defined as "urban" all territories, population, and housing units in urbanized areas and in places of 2,500 or more persons outside urbanized areas; "rural" was defined as those territories, populations, and housing units not classified as urban. These distinctions (urban or rural) cut across other

towns, small cities, and rural areas) are less likely to be characterized by disorder and decay—where small towns are comprised of residents with a mix of income levels in the same shared public space, with poor residents able to benefit from the resources available to the affluent (see, for example, Massey 1996). However, the extant literature does not sufficiently support such assumptions, but instead notes persistent concentrated poverty in rural areas (Lichter and Johnson 2007) and illustrates sociology's limited understanding of the poor people (and poor places) outside of major metropolitan areas (Lobao and Hooks 2007:30), as well as a lack of understanding about affluent places in general.

Disadvantage exists, to varying degrees, in all places. On average, though, rural areas contain higher unemployment and lower population densities, with higher proportions of poor residents than urban areas (Hart, Larson, and Lishner 2005; Lichter and Johnson 2007). Many persistently poor rural communities have high concentrations of racial/ethnic minorities (e.g., the Southern "Black Belt," Hispanics residing in the lower Rio Grande Valley, and Native Americans living on reservations in the Great Plains) (Lichter and Johnson 2007). In rural areas "the poor in poor communities are doubly disadvantaged," suffering not only from low income, but also experiencing a lack of institutional support and resources, as well as physical, cultural, and economic isolation from mainstream (i.e., urban and suburban) America (Jensen, McLaughlin, and Slack 2003:130). In recent decades, even suburban areas have experienced significant increases in poverty rates while central cities have experienced either smaller increases or declines (Murphy 2007; Dwyer 2010).

There is growing evidence of socioeconomic disadvantage in rural and suburban areas, and although crime rates are generally lower in rural areas, the stereotype of rural, suburban, and

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designations—e.g., there are both urban and rural areas within both metropolitan and non-metropolitan areas (U.S. Census Bureau 1995). In discussing past studies, we use the terminology used by those authors, but do note this distinction.

non-metropolitan areas as crime-free is erroneous (Liska, Logan, and Bellair 1998; Weisheit and Wells 2005). In the suburbs there exists racial/ethnic disparities in exposure to crime which are not explained by differences in income or household characteristics (Alba, Logan, and Bellair 1994). Further, a few recent studies examining non-urban places have linked the neighborhood characteristics there to adolescent outcomes such as sexual risk-taking (Akers, Muhammed, and Corbie-Smith 2011, examining two rural counties) and substance use (Hayes-Smith and Whaley 2009, examining rural and suburban school districts). Also, adolescents in rural areas have lower levels of educational achievement and a higher likelihood of high school dropout than peers in urban areas (Roscigno and Crowley 2001). This provides further evidence of the complicated ways that structural inequality operates across geographic areas. Extending our studies of neighborhoods to include non-urban areas can expand our understanding of neighborhood effects particularly with respect to the role of race/ethnicity and class across places.

Measuring Neighborhood Context: Variable-Centered vs. Neighborhood-Centered Approaches

Across traditional "variable-centered" neighborhood effects research, scholars often fail to provide a strong theoretical or empirical rationale for focusing on one neighborhood setting (urban), one particular compositional measure over another (e.g., poverty rate vs. median income) (Jencks and Mayer 1990:125), or any strong theoretical justification—beyond circumventing collinearity—for collapsing neighborhood racial/ethnic composition with socioeconomic measures of class. Certain items may not capture context uniformly and consistently across neighborhoods; as such, some researchers argue against using single dimensions to capture neighborhood effects. Gorman-Smith and colleagues' (2000) analysis of high-risk urban youth in Chicago revealed three distinct categories of neighborhoods, providing support for questioning the appropriateness of relying on a single dimension to compare

communities, and challenging the related assumption that all poor communities are the same. There are also problems with conventional approaches to categorizing neighborhoods that rely on only single indicators such as the poverty rate. Categorizations based on cutoff points (e.g., >40% poverty = ghetto poor; 20%-40% poverty = poor; <20% poverty = nonpoor) focus primarily on neighborhoods at the extreme end of the poverty rate distribution (highest poverty, concentrated disadvantage) and provide little to no information to distinguish between the less extreme neighborhoods (e.g., almost poor vs. nonpoor) that exist along the continuum of disadvantage (Morenoff and Tienda 1997). Cutoffs are arbitrary, and may only be applicable in specific areas. Selecting cutoffs requires researchers to make *a priori* assumptions about thresholds that may not correspond with meaningful distinctions across types of places contained within their data.

Furthermore, variable-centered approaches relying on linearly-coded measures of compositional characteristics often result in analyses and interpretations that may not be especially illustrative of existing neighborhood conditions, or accurately capture neighborhood processes (e.g., the effect of a one-unit increase in disadvantage or a one-standard deviation increase above the mean). Given established patterns of segregation and stratification, we know that neighborhoods do not differ from each other by arbitrary single unit increases/decreases in poverty. Variable-centered models thus provide a somewhat limited portrait of the larger social structural context of neighborhoods and neighborhood effects. Log-transforming a disadvantaged index, which is sometimes done to correct for the highly skewed distribution of disadvantage (see, for example, Morenoff, Sampson, and Raudenbush 2001), forces the measure into a linear association, but the substantive meaning behind the original nonlinear relationship becomes lost—further obscuring the implications of neighborhood context. As Freedman (1985:348)

notes, our focus should not be to "fit the data," but rather to figure out the process that generated the data (see also Abbott 1988).

Entering compositional characteristics as independently-modeled control variables obscures heterogeneity and "decontextualizes" the data (Luke 2005), ignoring the *meaning* behind given contexts and neglecting the causes and consequences of patterns and constellations of particular compositional characteristics. For example, "percent Black," while associated with various negative outcomes, is not in and of itself a particularly meaningful construct (nor can social structure be captured in a single measure). Rather, "percent Black" is a proxy, obscuring some structural characteristic or force (e.g., blocked opportunities, limited resources) that may be similarly applicable in places not characterized by large proportion of Black residents (e.g., predominantly White poor rural areas).

An alternative approach to the traditional, variable-centered neighborhood effects models is a neighborhood-centered approach, using cluster analysis (Aldenderfer and Blashfield 1984) [much like person-centered analytic approaches (Cairns et al. 1998)], to identify patterns among variables in the data, instead of relying on linear relationships between two or more variables. Here, the neighborhood is regarded as the key conceptual and analytical unit, emerging from components formulating it (e.g., race/ethnicity, class, and urbanicity/rurality) which operate jointly and simultaneously (and as such are indivisible, and cannot be understood as isolated entities) (Bergman 2009). A form of latent class analysis (Vermunt 2008; Marsh, Ludtke, Trautwein, and Morin 2009), cluster analysis can be used to uncover and describe contextual patterns (Luke 2005), as it is better suited to capture the complex intersections among co-varying measures (Dupere and Perkins 2007). Cluster analysis integrates analyses of both geographical and social space (Sampson and Morenoff 1997), potentially revealing unknown (or previously

unmeasured) heterogeneity that variable-centered approaches may miss (Luke 2005), and thus allowing researchers to observe more fully the impact of inequality *among* types of neighborhoods, which may be more detrimental than inequality *within* neighborhood types (Blau 1977). This approach—similar to what has been described as the *society-in-place* approach (Lobao and Hooks 2007)—explores how social processes (e.g., causal forces generating inequality) play out across places, recognizes that places differ from each other, and considers a variety of bounded and unbounded territories. A neighborhood-centered approach considering the broader, social structural context of neighborhoods allows us to explore neighborhood effects across *all* geographies.

Capturing neighborhood contexts in terms of neighborhood clusters, aside from being more meaningful theoretically, also offers interpretive advantages. To capture fully the multidimensional intersections between race/ethnicity, class, and urbanicity/rurality in linear models could require several 3- and 4-way interactions. Not only are such higher-order interaction terms difficult to interpret, but they can imply combinations of variables that may not exist or are infrequently observed in the data (e.g., high SES Black neighborhoods), which further undermines their utility. Cluster analysis allows only the neighborhood types actually represented in the data to emerge—classifying neighborhoods holistically (Plybon and Kliewer 2002) and without assuming a specific distribution in the data (Aldenderfer and Blashfield 1984; Sucoff and Upchurch 1998). It allows us to describe patterns and interrelations among race/ethnicity, class, and urbanicity/rurality, rather than describe how each construct operates "net" of the others (as in variable-centered approaches)—useful since, as Abbott (1992a; 1992b:5-6) notes, nothing in the social world occurs "net of other variables" (see also, Sampson 1993). A neighborhood-centered approach captures more fully the contexts structuring the risks

and resources to which individuals are exposed.

THE CURRENT STUDY

To address the substantive and methodological concerns associated with traditional variable-centered approaches to measuring neighborhood effects, the current study utilizes a neighborhood-centered cluster analysis approach to capture latent types of distinct neighborhood contexts in a nationally representative sample of adolescents. Cluster analysis allows us to illuminate the intersection of race/ethnicity, class, and urbanicity/rurality, as these dimensions reflect not simply explanatory variables, but rather variations in resources and opportunities (Earls and Carlson 2001). We contextualize and classify a typology of neighborhoods and then illustrate the utility of these neighborhood typologies by examining three indicators of adolescent risk behavior (exposure to violence, sexual activity, and cigarette smoking) across neighborhood types. Youth in disadvantaged neighborhoods are more likely to witness and experience violence (e.g., Aisenberg and Herrenkohl 2008; Gibson, Morris, and Beaver 2009), and to be sexually active (Upchurch et al. 1999; South and Baumer 2000) than their counterparts in more advantaged neighborhoods. The link between neighborhood characteristics and substance use, such as cigarette smoking, is less clear (Wilcox 2003). A neighborhood-centered analysis allows us to explore these associations across types of neighborhoods characterized by multiple dimensions of inequality.

DATA AND METHODS

We utilize data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative sample of adolescents in grades 7 through 12, in 1995. The primary sampling frame included 80 representative high schools, and their "feeder" middle schools, stratified by region of country, degree of urbanicity, school type (i.e., public and private),

racial/ethnic composition, and school size. Each participating school provided a roster of all enrolled students, from which a core sample of just over 20,000 adolescents was randomly selected for in-home interviews. Of those contacted at Wave I, approximately 79% agreed to participate. Our analyses use data from the Wave I in-home interview, subset to respondents with valid contextual data (n=20,547; respondents missing data on the outcomes of interest, and those without valid sample weights, are excluded from the multivariate exercise utilizing the neighborhood typologies—described below).[4] Neighborhood characteristics are all derived from the Add Health Wave I Contextual Database (Billy, Wenzlow, and Grady 1998) which contains demographic measures from the 1990 U.S. Census matched to the county, census tract, and census block group of respondents' home address (administratively de-identified in the restricted-use data). Data are available for 2,447 census tracts, which we use as the spatial unit of neighborhood context.[5]

Measures

Independent Variables. Because prior studies have used a number of various compositional indicators of neighborhood characteristics, our measurement strategy is guided by procedures outlined by Duncan and Aber (1997) in perhaps one of the most comprehensive treatments to date on capturing the social, economic, and demographic characteristics of neighborhoods. Their analysis provides a useful starting point for selecting the Census measures that best capture the dimensions of race/ethnicity, class, and urbanicity/rurality by which we argue neighborhoods are patterned. Using PSID data on adolescents living in metropolitan areas

[4] We rely on cross-sectional data because our objective for this analysis is to introduce a neighborhood-centered approach and demonstrate its utility for capturing neighborhood context. We are not exploring how contexts anchor trajectories of behavior with age—although that is a logical extension of the current analysis.

[5] We recognize the extensive literature debating the appropriateness of census tracts as measures of neighborhoods (e.g., Grannis 1998; Sampson et al. 2002; Bernard, Charafeddine, Frohlich et al. 2007; Hipp 2007), yet we use them here because it is a standard approach in the literature. We also note that a recent simulation by Nau (2011) shows that block group- and tract-level models of neighborhood effects perform similarly, while the smaller block-level measures led to underestimated effects.

in 1980, Duncan and Aber (1997) submitted 34 Census variables to an exploratory factor analysis (EFA) in order to specify multiple neighborhood dimensions, rather than choosing a single item to represent neighborhood context. Their analyses revealed a six-factor solution: low SES, high SES, male joblessness, ethnic diversity, family concentration, and residential stability. The Add Health Contextual Database contains equivalent measures for 20 of their 34 items, which are listed in the Appendix Table. We submitted these 20 items to an exploratory factor analysis (with varimax rotation) and found a similar set of factors (comprised of items with factor loadings greater than 0.40)—low SES and high SES (capturing class), ethnic diversity (capturing racial/ethnic composition), and residential stability.[6] Replicating these factors was useful for identifying key compositional indicators and verifying the adequacy of Add Health's available census tract measures for capturing neighborhood context. However, Duncan and Aber (1997) did not subject their factors to a cluster analysis; therefore, our strategy for summarizing these neighborhood dimensions for the purpose of the neighborhood-centered cluster analysis differs from Duncan and Aber (1997) in several key ways, which we outline below.

Class. Although the percent of Black residents in the tract loads significantly on the factor capturing low SES (Factor 1), we do not include it as a measure of SES, in order to avoid conflating race/ethnicity and class. Entering racial/ethnic composition and SES separately in the cluster analysis allows us to examine the ways in which race/ethnicity and class intersect in the patterning of neighborhood contexts. Therefore, we measure *low SES* as a mean scale comprised of the tract-level (a) proportion of female-headed households, (b) proportion of families earning less than $15,000, (c) proportion of residents living below the federal poverty level, (d) the proportion of residents age 25 and older with less than a high school education, (e) the

[6] Because Add Health respondents' addresses are de-identified in the restricted-use data, we could not append Census measures that would allow us to replicate the male joblessness and family concentration factors.

proportion of households receiving public assistance, and (f) the unemployment rate (Cronbach's $\alpha = 0.95$). *High SES* is measured with a mean scale comprised of the tract-level (a) proportion of college-educated persons, (b) proportion of residents employed in professional/managerial occupations, and (c) proportion of families earning more than $50,000 (Cronbach's $\alpha = 0.93$). We also use *median household income* as a separate measure in the cluster analysis (rather than collapse it into a measure of high SES); we do this in order to differentiate between neighborhoods that do not fall into one of the extreme ends of the income distribution—a distinction necessary for capturing thresholds, tipping points, and other points of interest along the socioeconomic continuum (and which may differ by neighborhood racial/ethnic composition and urbanicity/rurality) (see Crane 1991; Morenoff and Tienda 1997; Luke 2005).

Racial/Ethnic Composition. We include three separate items gauging ethnic diversity/immigrant presence: (a) *the proportion of Hispanic residents*, (b) *proportion of residents who are non-Hispanic Asian/Pacific Islander or other race*, and (c) *the proportion of foreign born residents*. Although these three items all load on a single factor, similar to Duncan and Aber's (1997) ethnic diversity measure, we do not combine these measures in the cluster analysis, primarily in order to distinguish predominantly native-born Hispanic neighborhoods from predominantly immigrant neighborhoods. It is important to differentiate these neighborhood types to allow for the possibility that foreign-born individuals reside in different types of neighborhoods than their native-born counterparts (Friedman and Rosenbaum 2007; Allen and Turner 2009). Also, processes of assimilation have been shown to vary across ethnic groups and outcomes of interest (for a review, see Greenman and Xie 2008)—thus we would not want to conflate ethnicity and nativity status. Finally, we measure neighborhood *racial composition* as the proportion of non-Hispanic Black residents.

Urbanicity/Rurality. Because Duncan and Aber's (1997) analysis focused on metropolitan areas, they did not include measures of urbanicity when assessing neighborhood effects. We build on this research by including a range of geographic areas, drawing on urban, suburban, and rural neighborhoods. Therefore, we measure *urbanicity/rurality* as the tract-level population density. We believe population density is a better proxy for urbanicity/rurality than total population because, although Census tracts are delineated to be relatively homogeneous with respect to population characteristics, socioeconomic status, and living conditions, the spatial size of tracts varies considerably dependent on density of the settlement (U.S. Census Bureau 2001:A-11). Also, population density is used by the U.S. Census Bureau for classifying areas as urban or rural. We do not use alternative measures, such as the proportion of residents living in urban areas (which loaded highly on the "urbanicity" factor [Factor 5], Appendix), because the Census definition of "urban areas" differs between the 1990 and 2000 Census, and future analyses using the Wave III Add Health survey and contextual data (derived from the 2000 Census) would not be consistent with the typologies developed using data from the 1990 Census.[7] In addition, Add Health interviewers were asked to assess whether the respondents' residence was in an urban, suburban, or rural area—we use this assessment to assist with labeling the extracted clusters (but did not include it in the actual cluster analysis).[8]

[7] We included proportion urban residents in preliminary cluster analyses and found that it distinguished clusters similarly to population density, suggesting that population density is a suitable alternative to proportion urban residents. In further preliminary analyses, we explored alternative measures of urbanicity/rurality such as street density, road connectivity, and rural-urban commuting area classifications—all obtained from the Obesity and Neighborhood Environment (ONE) add-on (Gordon-Larsen 2008). None of these measures enhanced our ability to distinguish neighborhood types beyond that provided by population density.

[8] Two items loaded on a factor capturing residential stability—proportion of residents in the same home as five years prior and the proportion of owner-occupied housing units. However, consistent with Duncan and Aber (1997), we exclude this measure from our analyses because both high and low rates of residential mobility may indicate neighborhood problems (see also, Korbin and Coulton 1997). Further, some studies suggest that the effect of residential instability varies across types of places and by race (e.g., Lee, Bankston, Hayes, and Thomas 2007). In preliminary cluster analyses we explored including this measure of residential stability, but found that it did not aid us in distinguishing meaningfully different neighborhood clusters.

A Neighborhood-Centered Analytic Strategy

Drawing from the results of our exploratory factor analysis, we classify neighborhoods using eight measures that tap three overarching dimensions: (1) *socioeconomic status* (low SES, high SES, median household income; (2) *racial/ethnic composition* (proportion of non-Hispanic Black residents; proportion of Hispanic residents, proportion of residents Asian/Pacific Islander or other race, proportion of foreign born residents); and (3) *urbanicity/rurality* (population density). Because attributes with large variances can bias the cluster analysis (Lorr 1983), all eight items are standardized into deciles prior to executing the cluster analysis.

To capture the types of neighborhoods occupied by Add Health respondents, we use a two-stage cluster analysis procedure (Gorman-Smith et al. 2000; Li and Chuang 2008; Gershoff, Pedersen, and Aber 2009). In the first stage, we execute a non-hierarchical *K*-means method of clustering the 2,447 neighborhoods, using the SAS® PROC FASTCLUS procedure (designed to handle large sample sizes). In this method, observations are divided into a pre-specified number of clusters (in this case, 100), cluster centroids (the mean of the variables on which the clustering is based) are calculated, and observations are joined to the cluster centroid based on the distance between the observation's score profile (the mean score across variables) and the cluster centroid value (Lorr 1983; Gorman-Smith et al. 2000; Clatworthy, Buick, Hankins et al. 2005; Dupere and Perkins 2007). The distance (also called similarity) between the profiles of any two observations is measured via squared Euclidean distances; that is, the sum of squared differences in scores between the two observations over a given set of variables:

$$D^2 = \sum \left(X_{ij} - X_{hj}\right)^2$$

where X_{ij}= observation *i*'s value on variable *j* and X_{hj}= observation *h*'s value on variable *j* (Lorr 1983:16). This is an iterative process, such that when an observation is added to a cluster, the

centroid (mean) is recalculated, and the process continues until all observations are clustered. During this process, the clustering program can reassign observations to a different cluster in order to minimize within-cluster and maximize between-cluster heterogeneity so that clusters represent distinct classes of observations.

This first stage of analysis generates preliminary clusters that are then subjected to a second stage of cluster analysis. Here, in the SAS® PROC CLUSTER procedure, we use a hierarchical agglomerative method (Ward's minimum variance) (Aldenderfer and Blashfield 1984; Morenoff and Tienda 1997; Plybon and Kliewer 2002; Clarke and Wheaton 2007).[9] Ward's method aims to minimize the sum of squared within-group deviations about the group mean, thus minimizing the variance within clusters and creating relatively homogenous groups (Lorr 1983:90); it also joins clusters with a small number of observations and is biased toward producing clusters with roughly the same number of observations (SAS/STAT User's Guide 2008). Although a concern of cluster analysis is that it may introduce artificial within-group heterogeneity, including an array of compositional indicators that capture race/ethnicity, class, and urbanicity/rurality (rather than focusing *only* on indicators of socioeconomic status, for instance) aids Ward's method in maximizing further the within-group homogeneity of extracted clusters (see, Clarke and Wheaton 2007). This allows us to explore the extent to which neighborhoods come together across multiple dimensions to form meaningful, unique types. Nelson and colleagues (2006) and Sucoff and Upchurch (1998) have demonstrated the applicability of cluster analysis for deriving neighborhood typologies in national samples.

RESULTS

The number of potential neighborhood types, while unknown, is not infinite, and it is

[9] In preliminary analyses, we also estimated the cluster analysis via the centroid hierarchical method (following Aneshensel and Sucoff 1996)—while this method produced several clusters similar to those generated by Ward's method, Ward's methods generated more meaningful, distinct clusters.

important to recognize the sizeable number of combinations possible across these eight measures in a nationally representative dataset like Add Health. There are no agreed upon statistical criteria for determining the number of clusters, but rather there are several different "stopping rules"—heuristic, ad hoc procedures (Milligan and Cooper 1985) that can be used to indicate when the number of clusters identified is sufficient [although their availability differs across statistical software packages (Lorr 1983; Clatworthy et al. 2005)]. Here we use three such procedures: (1) the cubic clustering criteria (CCC), where increasingly positive CCC values indicate the presence of clusters in the data (Sarle 1983); (2) the pseudo-*F* statistic, with relatively large values suggesting an optimal number of clusters (SAS/STAT User's Guide 2008); and (3) the R^2, which represents the proportion of variance accounted for by a given number of clusters. Based on these three criteria, we extracted 15 clusters. The CCC suggested that neighborhoods may be clustered into as few as five clusters (where CCC=12.5); however, the CCC steadily increased until about 15 clusters (where CCC=132), after which point the CCC leveled off. The pseudo-*F* statistic for this 15 cluster solution was 6,995. Lastly, a solution with 15 clusters captured 82.7% of the variance in the eight items used in the analysis. The appropriateness of the 15 cluster solution is evident in comparison to two alternatives identified. For example, the 5 cluster solution had a larger pseudo-*F* statistic of 7,532 but did not perform as well on the R^2, explaining only 59.5% of the variance. Likewise, a 25 cluster solution—with 10 more clusters—explained just 5.8% more variance (88.5%) than our 15 cluster solution, but had a lower pseudo-*F* statistic of 6,591.

This number of neighborhood clusters is larger than the number of clusters extracted in some previous studies, but cluster numbers vary across data sources and clustering measures—for instance, Aneshensel and Sucoff (1996) derived eight neighborhood types, Upchurch and

colleagues (1999) nine, Sucoff and Upchurch (1998) found four neighborhood types in a sample of Black women, while Gorman-Smith and colleagues (2000) observed three types of neighborhoods in Chicago. The greater number of clusters indentified here is to be expected because our study differs from these other studies by using a nationally representative sample that is not limited to metropolitan areas. Classifying neighborhoods across three overarching dimensions: racial/ethnic composition, class, and urbanicity/rurality enables us to explore not just racially and ethnically proscribed risks, but also risks associated with socioeconomic status and geographic context.

We label the neighborhood clusters as follows, based on our interpretation of neighborhood types, our examination of the descriptive statistics of each cluster, interviewers' assessments about the urbanicity of respondents' neighborhoods, and our expectations about particular patterns: (1) poor White urban, (2) poor White rural, (3) poor Black rural, (4) poor Black/White urban, (5) poor Black urban, (6) poor Hispanic immigrant urban, (7) poor/working class Hispanic urban, (8) working class Asian suburban, (9) working class Black urban, (10) working class White urban, (11) working class White rural, (12) middle class Hispanic/Asian urban, (13) middle class Black suburban/urban, (14) middle class White suburban, and (15) affluent White suburban.

The distributions of survey respondents and census tracts across neighborhood types are presented in Table 1. The largest proportions of all survey respondents reside in poor White rural, working class White rural, and middle class White suburban neighborhoods. Demographic profiles of each neighborhood type are presented in Table 2. Here we list median values (and ranges) for each neighborhood type across the tract-level measures used in the cluster analysis. Among the noteworthy observations garnered from this table are that the median income in poor

White urban neighborhoods is $21,000, compared to only $11,510 in poor Black urban neighborhoods; the median income in working class Black urban neighborhoods is $29,670, while in working class White urban neighborhoods it is $35,470.

[Table 1 and Table 2 about here]

Table 3 displays the racial/ethnic composition of each neighborhood type and the distribution of survey respondents across neighborhood types by race/ethnicity. The racial/ethnic composition of survey respondents within each neighborhood type appears relatively consistent with our labels derived from the Census data. For example, among respondents in middle class Black suburban/urban neighborhoods (cluster 13) 78.69% are Black, whereas 90.41% of respondents in working class Black urban neighborhoods (cluster 9) are Black and over 80% of respondents in middle class White suburban neighborhoods (cluster 14) are White.

Regarding the distribution of respondents across neighborhood types by race/ethnicity, White respondents disproportionately reside in working class White rural (26.86%), poor White rural (22.26%), and middle class White suburban (21.23%) neighborhoods. Black respondents are distributed across more neighborhood types, but the largest percent (19.59%) reside in poor Black urban neighborhoods, followed by poor Black rural neighborhoods (13.24%). Despite the common conceptualization that Black race is synonymous with poor *and* urban (a relationship often observed in primarily metropolitan samples), just one-fifth of Black adolescents live in poor Black urban neighborhoods. However, in this sample, 63.19% of Black adolescents live in any kind of poor neighborhood, compared to 35.02% of White adolescents. Hispanic respondents live mostly in middle class Hispanic/Asian urban (19.06%) and poor Hispanic immigrant urban neighborhoods (15.70%). Asian respondents are most concentrated in middle class Hispanic/Asian mixed race (36.78%), working class White urban (22.05%), and working class

Asian urban (13.0%) neighborhoods. These descriptive statistics illustrate patterns of racial/ethnic segregation, particularly among White and Black respondents, and within predominantly Black neighborhoods. White respondents are concentrated within predominantly White neighborhoods, but there are also fairly large proportions of Hispanic, Asian, and American Indian/other race respondents in these neighborhoods, while there are substantially smaller proportions of these respondents in any of the predominantly Black neighborhoods.

[Table 3 about here]

Demonstrating the Utility of a Neighborhood-Centered Approach

We illustrate the utility of our neighborhood-centered approach by examining differences in youths' exposure to violence, sexual activity, and cigarette use across neighborhood types. *Exposure to violence* is a dichotomous measure coded 1 for respondents reporting that they had "seen someone shot or stabbed during the past year." Approximately 13% of respondents report witnessing violence. *Sexual activity* is a dichotomous measure coded 1 for respondents who reported ever having had sexual intercourse. Forty percent of respondents were sexually active by Wave I. *Cigarette use* is a dichotomous measure coded 1 for respondents who answered affirmatively to the question: "Have you ever smoked cigarettes regularly, that is, at least 1 cigarette every day for 30 days?" Approximately 20% of respondents reported regular cigarette use. We exclude 2,084 respondents (10.14%) from these analyses because they are missing data on these dependent variables (n=289, 1.41%) and/or do not have valid sample weights (n=1795, 8.74%). Because the objective of this analysis is to explore a neighborhood-centered methodology for more fully capturing neighborhood contexts, we focus only on neighborhood typologies in this illustration, and do not include individual-level correlates (e.g., age, race, gender, etc.) of risk behaviors.

We first use multivariate logistic regression to demonstrate a traditional, variable-centered approach (using linearly-coded measures of neighborhood context) for assessing the association between neighborhood context and youths' experiences with violence, sexual activity, and cigarette use. Entering neighborhood composition items in a traditional multiple regression model assumes that they affect the outcome independently of each other, and that their combined effects are only additive, an assumption not met theoretically or substantively (Bronfenbrenner 1999). Capturing fully the dimensions of race/ethnicity, class, and urbanicity/rurality using traditional measures would necessitate multiple interactions terms (Dupere and Perkins 2007), resulting in a model that is computationally complex and cumbersome to interpret. Table 4 illustrates such a model, using most of the same items we used in our cluster analysis (low SES, high SES, proportion Black residents, proportion Hispanic residents, proportion residents Asian/Pacific Islander or other, proportion foreign born, and population density) as independent, linear effects. To capture the intersections between race/ethnicity, class, and urbanicity in this variable-centered approach would require at least 17 two-way and 6 three-way interactions. As denoted in Table 4 by "UE," we were unable to estimate most of the interaction terms because they represented combinations of compositional characteristics not observed frequently enough in the data to produce reliable estimates (e.g., high SES Hispanic).

Model 1 (Table 4) explores the association between neighborhood characteristics and exposure to violence. The main effect of low SES (OR = 18.27), while significantly positively associated with violent exposure, is difficult to interpret, as it represents the effect of low SES for individuals in neighborhoods with no Black residents and a population density of zero (given the two- and three-way interaction terms we were able to estimate between low SES, proportion

Black residents, and population density). Because we were unable to estimate interaction terms between SES and neighborhood racial/ethnic composition, other than proportion Black residents, we are unable to ascertain from this analysis how race/ethnicity, class, and urbanicity/rurality intersect to shape exposure to violence for youth in neighborhoods comprised of Hispanic, immigrant, and/or Asian/Pacific Islander or other race/ethnicity across geographic types.

This, of course, is a hypothetical analysis, for purely illustrative purposes, as researchers adhering to a variable-centered approach would never specify the model in exactly this way. Researchers would instead rely on more parsimonious specifications with few, if any, higher-order interactions. However, this in and of itself is further evidence of the shortcomings of variable-centered approaches, unable to capture fully the intersections of race/ethnicity, class, and urbanicity/rurality comprising neighborhood contexts—this is consistent with the paradox Fagan (1993:381) observed where "our methods grow more powerful and precise as we move even farther away from our data and the complex realities they represent."

[Table 4 about here]

Tables 5-7, one for each risk outcome, illustrate how the information we were unable to estimate in the variable-centered approach can be presented parsimoniously and informatively using the neighborhood-centered cluster analysis approach. We also rotate the reference groups across each set of models, allowing for comparisons against respondents in middle class White suburban neighborhoods (Model 1), middle class Black suburban/urban neighborhoods (Model 2), poor White rural neighborhoods (Model 3), and poor Black urban neighborhoods (Model 4). We use middle class White neighborhoods as the primary reference category because this neighborhood type is generally considered to be one of the most advantageous contexts, and is often an "unspoken" reference category in much of the neighborhood effects research focused on

experiences of residents in disadvantaged urban neighborhoods. We next contrast neighborhood types against middle class Black neighborhoods, given that few quantitative studies have explored differences in experiences among adolescents in this neighborhood type. Our third model uses poor White rural neighborhoods as the reference group because much of the neighborhood effects research focuses on urban areas—this set of analyses allows us to position urban adolescents against their counterparts in rural neighborhoods. The final model uses poor Black urban neighborhoods as the reference category, to mirror the focus of much of social disorganization researchers on this neighborhood type. For summary purposes, the results of all three sets of the models using middle class White suburban neighborhoods as the comparison category are presented in Figure 1. These tables also display the prevalence of each risk behavior across neighborhood types.

[Figure 1 about here]

The analyses in Table 5 explore the association between neighborhood type and adolescent exposure to violence. Recall that, on average, about 13% of respondents reported witnessing violence. The percentages displayed in Table 5 show that this varied, fairly extensively, across neighborhood types. Around one quarter of youth in poor and working class Black urban neighborhoods reported witnessing violence, compared to about 15% of youth in poor White urban neighborhoods and only 5% of youth in working class Asian suburbs. As Model 1 shows, compared to adolescents from middle class White neighborhoods, adolescents from poor (cluster 5) and working class (cluster 9) Black urban neighborhoods have over 6 times the odds of witnessing violence. Adolescents from poor (cluster 1) and working class (cluster 10) White urban neighborhoods have almost 3 times the odds, and even adolescents in poor White rural neighborhoods (cluster 2) have higher odds of exposure to violence. Model 2 shows that

youth in poor and working class Black urban neighborhoods have higher odds of exposure to violence than their counterparts in middle class Black neighborhoods. The finding that youth in middle class Black neighborhoods are still more likely to witness violence than those in middle class White neighborhoods is consistent with Pattillo's (2005) argument that middle class Black neighborhoods are *not* equivalent to middle class White neighborhoods. As Model 3 shows, only adolescents in working class Asian (cluster 8) and middle class White neighborhoods (cluster 14) fare better than adolescents in poor White rural neighborhoods. Finally, adolescents from poor Black urban neighborhoods have generally higher odds of exposure to violence than adolescents from almost all other neighborhood types (Model 4).

[Table 5 about here]

Table 6 explores the association between neighborhood type and the odds of being sexually active, with the same series of rotated reference groups as in Table 5. On average, 40% of all respondents reported being sexually active, but this ranged from as low as 27% in affluent White suburban neighborhoods to as high as 54% of youth in poor Black urban neighborhoods. As Model 1 shows, compared to adolescents from middle class White neighborhoods, adolescents from working class Black neighborhoods (cluster 9) have over 3 times the odds of being sexually active; youth in poor Black rural (cluster 3), poor Black urban (cluster 5) and middle class Black suburban (cluster 13) neighborhoods have over twice the odds of being sexually active than their counterparts in middle class White suburbs. Youth in poor White urban and rural neighborhoods also have higher odds of being sexually active. Youth in any poor urban neighborhood, regardless of racial/ethnic composition were no more or less likely to be sexually active than youth in middle class Black neighborhoods (Model 2). Compared to youth in poor White rural neighborhoods (Model 3), only youth in working class Asian suburban (cluster 8)

and affluent White suburban (cluster 15) neighborhoods had lower odds of sexual activity. No other neighborhood type was associated with higher odds of sexual activity compared to poor Black urban neighborhoods (Model 4). The finding that youth in poor White urban and rural neighborhoods had lower odds of being sexually active than their peers in poor Black urban neighborhoods suggests that disadvantage does not have the same effect across racial/ethnic groups and geographic settings. Also, the finding (Model 3) that youth in White working class urban, middle class suburban, and affluent suburban neighborhoods (clusters 10, 14, and 15) all had lower odds of sexual activity than youth in poor White rural neighborhoods (cluster 2) shows that risk behavior is not distributed similarly across predominantly White neighborhoods.

[Table 6 about here]

The final set of analyses explores the association between neighborhood type and regular cigarette use (Table 7). Many of the patterns observed here differ from those in the previous two sets of models, and we observe a wide range in the percent of youth reporting cigarette use across neighborhood types. While the sample average was 20%, as few as 7% of youth in poor and working class Black urban neighborhoods reported smoking, compared to almost 30% of youth in poor White urban neighborhoods. That youth in poor White urban neighborhoods reported the highest smoking rate suggests that this behavior is not entirely driven by differences in financial accessibility (youth in poor and working class White rural neighborhoods reported the next highest rates of cigarette use). As Model 1 demonstrates, adolescents in poor (cluster 5) and working class (cluster 9) Black urban neighborhoods, as well as youth in poor (cluster 6) and working class (cluster 7) Hispanic urban neighborhoods are *less* likely to smoke cigarettes than youth in middle class White neighborhoods. Compared to adolescents in middle class Black neighborhoods (Model 2), youth in poor White urban neighborhoods (cluster 1) have over 3

times the odds of smoking cigarettes; youth in poor (cluster 2) and working class (cluster 11) White rural neighborhoods have over twice the odds. In Model 3, only youth in poor White urban neighborhoods have significantly higher odds of smoking than those in poor White rural neighborhoods. Finally, compared to adolescents in poor Black urban neighborhoods (Model 4), youth in poor White urban (cluster 1) and rural (cluster 2) neighborhoods, working class White urban (cluster 10) and rural (cluster 11) neighborhoods, and middle class (cluster 14) and affluent (15) White suburbs all have significantly higher odds of regular cigarette use. Further, even youth in working class Asian suburbs (cluster 8) have over twice the odds of smoking than their counterparts in poor Black urban neighborhoods.

These findings show that regular cigarette use appears most common among youth in predominantly White neighborhoods, regardless of neighborhood socioeconomic class or urbanicity/rurality. It is unlikely that a variable-centered approach including only a single measure or multi-item index of neighborhood disadvantage would be able to capture such a pattern. In fact, Model 3 in Table 4 shows that neighborhood low SES is positively associated with cigarette use, but "proportion Black residents" is not significant—this model is unable to illustrate, for example, that youth in predominantly Black neighborhoods are significantly less likely to smoke than their peers in any type of predominantly White neighborhood.

[Table 7 about here]

DISCUSSION

"Neighborhood" may have meanings and consequences neither bound by geographic proximities nor captured in single compositional measures. Place has a geographic and a social location. It is socially constructed and maintained by individuals, families, networks, organizations, institutions—proximal and distal—operating individually or in concert across a

range of geographic scales (Cummins, Curtis, Diez-Roux, and Macintyre 2007:1828). Variable-centered approaches that include only a few compositional measures, or analyses simply controlling for contextual characteristics, may lead researchers to overlook more nuanced distinctions in neighborhoods, particularly the intersection of key indicators of structural inequality. It is important to distinguish "ways of thinking about" from "ways of measuring" neighborhoods (Burton, Price-Spratlen, and Spencer 1997:132). Neighborhood context is more than an aggregate of individual-level characteristics, and even more than the sum of aggregate-level characteristics, a necessary distinction in order to recognize the importance of community-level over individual-level interventions (Robert 1999). Urban sociology and neighborhood effects research have provided vast insights into how social structure may affect a variety of individual- and community-level outcomes. However, this research has neglected certain neighborhood "types" (e.g., rural, poor non-Black, and majority-immigrant neighborhoods), and thus the applicability of "neighborhood effects" to these places has remained in question.

Rather than address the topic of spatial measurement methods (geographic information systems, systemic social observations, cognitive mapping) or units of analysis (block, tract, city, county) (Sampson and Raudenbush 1999; Clapp and Wang 2006), the current study illustrates how it is possible to simultaneously and holistically consider the intersecting roles of neighborhood racial/ethnic composition, class, and urbanicity/rurality in the structuring of neighborhood context. We do this by applying a neighborhood-centered cluster analysis approach to capturing neighborhood contexts and studying the association between neighborhood types and three examples of adolescent risk behaviors. Our findings show variation in the types of neighborhood contexts in which adolescent development takes place, and highlight the ability and importance of considering multiple dimensions of inequality that

shape individuals' exposure to risks. We extracted 15 neighborhood types from our data—while this is generally more than previous analyses have observed, we note that our analyses embraced geographic setting, socioeconomic profile, *and* racial/ethnic composition. While 15 types may seem unwieldy, we argue that it is important to avoid diluting the effect of particular contexts by collapsing neighborhoods into too few categories. Fifteen typologies allow us to observe more fully the ways in which neighborhood contexts differ from each other.

In the exercise illustrating the applicability of a neighborhood-centered approach to an analysis of adolescent risk behavior, we find important differences across neighborhood contexts, showing that adolescents' experiences differ by neighborhood types. The results of these three sets of analyses (particularly as displayed in Figure 1), while fairly exhaustive, highlight the important finding that adolescents' experiences with risky behaviors (violence, sex, and substance use) differ across neighborhood types, with patterns differing across the outcome of interest. There is no single, unified pattern, for instance, that adolescents from poor neighborhoods or predominantly Black neighborhoods always fare worse than their counterparts in more affluent or predominantly White neighborhoods. Two particularly noteworthy findings concern the experiences of adolescents in middle class Black urban and poor White urban neighborhoods. Although adolescents in middle class Black neighborhoods are more likely to witness violence than those in middle class White suburban neighborhoods, they are less likely to witness violence than their peers in poor Black urban neighborhoods, suggesting variation in the experiences of youths across predominantly Black neighborhoods, variation that traditional variable-centered approaches (modeling neighborhood disadvantage as linear) are unable to observe. Also, adolescents in poor White urban neighborhoods are more likely to witness violence, to be sexually active, and to smoke cigarettes than adolescents in middle class White

suburban, indicating that predominantly White neighborhoods are not universally protective (this is particularly true with respect to substance use). As the findings in Table 4 illustrate, such a pattern of risk behavior across predominantly White neighborhoods would be difficult to observe in traditional approaches. Further, focusing only on urban neighborhoods would lead researchers to miss the high rates of cigarette use among youth in rural neighborhoods regardless of the neighborhood racial/ethnic composition (even youth in poor Black rural neighborhoods were more likely to smoke than their peers in poor Black urban neighborhoods).

Despite the findings gleaned from our study, there are limitations that should be noted. For instance, Add Health is a school-based study, and therefore our analytic sample does not constitute a nationally representative sample of neighborhoods. The current analysis used contextual data from the 1990 Census, which gives us measures of neighborhood context at only a single point in time—we do not have information on how respondents' neighborhoods may have been changing around them. An additional challenge for neighborhood researchers has been disentangling neighborhood effects from selection effects—possible unobserved individual (or family) characteristics that may be associated with selection into neighborhoods and affect outcomes, rendering neighborhood effects spurious (for discussions, see Tienda 1991; Sampson et al. 2002; for a recent analysis, see Johnson 2011). Individuals (particularly adolescents) do not randomly select themselves into neighborhoods; however, we note that research continues to highlight the persistence of neighborhood effects even net of individual and family characteristics (Elliott et al. 2006).

Notwithstanding these limitations, the current study expands and contributes to the vast body of research highlighting the importance of neighborhoods as life course contexts reflecting multiple dimensions of structural inequality. Our neighborhood-centered approach suggests that

rather than allowing our inquiries to be limited by the available data, and our theories modified by the available methods (Abbott 1992b; Sampson 1993), we should realize that "place" means more than a fixed geographic point or spatial area. "Place" encompasses settings for development, and the characteristics of these settings are unequally distributed across individuals based on race/ethnicity, class, and urbanicity/rurality.

Future research can extend our analyses in a number of ways. First, neighborhoods have implications for access to risks and resources—while the current study focused only on risk behaviors, one avenue to explore is whether access to resources (e.g., health care) and/or the presence and effect of certain protective factors (e.g., informal social control, positive role models, etc.) differs across neighborhood types. Second, scholars can also explore whether differences across neighborhood types exist for other risk behaviors such as delinquency (e.g., status or property offenses), illicit substance use, or teenage pregnancy, and protective/pro-social behaviors such as academic achievement and aspiration, and more global measures of well-being (e.g., mental and physical health). Third, research can further the ecological perspective by investigating interactions between individual- and family-level characteristics and neighborhood type. For instance, Bronfenbrenner's (1979) ecological perspective emphasizes the placement of individuals and their micro-level relationships within a larger macro-level context, the interactive nature of these relationships and contexts, and how individual-level characteristics emerge as a joint function of mutual and reciprocal person-environment interactions over time. While this study focused only on neighborhood-level measures, it is important to utilize measures on the socioeconomic profile of neighborhoods in conjunction with data on the socioeconomic positions of individuals within those neighborhoods to uncover best the independent and indirect pathways through which neighborhood context affects individual health and well-being (Robert 1999). The

neighborhood-centered approach employed here could also be used to explore subgroup variations in community effects (e.g., variations by age, race, gender, individual SES, etc.).

Additional avenues for future research would be to utilize longitudinal data to explore longer-term effects of neighborhood type on youth health and well-being, and apply the neighborhood typologies to indicators of health and well-being among other age groups. Multidimensional conceptual models of place can take into consideration how certain constellations of neighborhood characteristics may differentially interact with certain characteristics of individuals (e.g., age, race, gender, self-efficacy) or even other contexts (e.g., families, schools, peer groups) across the life course (Cook, Herman, Phillips, and Settersten 2002; Settersten and Andersson 2002; Settersten and Gannon 2005), allowing researchers to examine how neighborhood context may moderate the effects of the processes that occur within them (Shinn and Toohey 2003). Capturing neighborhood context in such a way as presented here—contextualizing multiple dimensions of inequality—can challenge what we think we know about neighborhoods and the social processes occurring within (and between) them, by allowing neighborhood effects researchers to recognize that seemingly well-established relationships may not be universal across all types of contexts (Shinn and Toohey 2003; Lobao 2004; Lobao and Hooks 2007). Such an observation fits squarely with the life course perspective's position that developmental processes are not universally applicable across persons or contexts (Elder 1998; Dannefer and Kelley-Moore 2009). A neighborhood-centered approach such as the one we present here is a crucial step toward expanding our understanding of how the structural dimensions of neighborhood inequality matter for children, adolescents, and adults.

REFERENCES

Abbott, Andrew. 1988. "Transcending Linear Reality." *Sociological Theory* 6:169-186.

—. 1992a. "From Causes to Events: Notes on Narrative Positivism." *Sociological Methods & Research* 20:428-455.

—. 1992b. "Of Time and Place: The Contemporary Relevance of the Chicago School." Sorokin Lecture delivered at the annual meeting of the Southern Sociological Society, New Orleans, LA.

Aber, J. Lawrence, Martha A. Gephart, Jeanne Brooks-Gunn, and James P. Connell. 1997. "Development in Context: Implications for Studying Neighborhood Effects." Pp. 44-61 in *Neighborhood Poverty: Context and Consequences for Children*, edited by J. Brooks-Gunn, G. J. Duncan, and J. L. Aber. New York: Russell Sage Foundation.

Aisenberg, Eugene and Todd Herrenkohl. 2008. "Community Violence in Context: Risk and Resilience in Children and Families." *Journal of Interpersonal Violence* 23:296-315.

Akers, Aletha Y., Melvin R. Muhammed, and Giselle Corbie-Smith. 2011. ""When You Got Nothing to Do, You Do Somebody": A Community's Perception of Neighborhood Effects on Adolescent Sexual Behaviors." *Social Science and Medicine* 72:91-99.

Alba, Richard D., Nancy A. Denton, Shu-Yin Leung, and John R. Logan. 1995. "Neighborhood Change under Conditions of Mass Immigration: The New York City Region, 1970-1990." *International Migration Review* 29:625-656.

Alba, Richard D., John R. Logan, and Paul E. Bellair. 1994. "Living with Crime: The Implications of Racial/Ethnic Differences in Subruban Location." *Social Forces* 73:395-434.

Aldenderfer, Mark S. and Roger K. Blashfield. 1984. *Cluster Analysis*. Newbury Park, CA: Sage Publications, Inc.

Allen, James P. and Eugene Turner. 2009. "Ethnic Residential Concentrations with above-Average Incomes." *Urban Geography* 30:209-238.

Aneshensel, Carol S. and Clea A. Sucoff. 1996. "The Neighborhood Context of Adolescent Mental Health." *Journal of Health and Social Behavior* 45:293-310.

Arnett, Jeffrey Jensen. 2000. "Emerging Adulthood: A Theory of Development from the Late Teens through the Twenties." *American Psychologist* 55:469-480.

Bergman, Lars R. 2009. "Person-Oriented Approaches." Pp. 352-355 in *Encyclopedia of the Life Course and Human Development*, edited by D. Carr. Detroit: Gale Centage Learning.

Bernard, Paul, Rana Charafeddine, Katherine Frohlich, Mark Daniel, Yan Kestens, and Louise Potvin. 2007. "Health Inequalities and Place: A Theoretical Conception of Neighborhood." *Social Science & Medicine* 65:1839-1852.

Billy, John O.G., Audra T. Wenzlow, and William R. Grady. 1998. "National Longitudinal Study of Adolescent Health, Wave I and Ii Contextual Database." Carolina Population Center, University of North Carolina at Chapel Hill.

Blau, Peter M. 1977. *Inequality and Heterogeneity: A Primitive Theory of Social Structure*. New York: Free Press.

Briggs, Xavier de Souza. 2005. *Geography of Opportunity: Race and Housing Choice in Metropolitan America*. Washington, DC: Brookings Institution Press.

Bronfenbrenner, Urie. 1979. *The Ecology of Human Development*. Cambridge: Harvard University Press.

—. 1989. "Ecological Systems Theory." Pp. 187-250 in *Annals of Child Development--Six Theories of Child Development: Revised Formulations and Current Issues*, edited by R. Vasta. Greenwich, CT: JAI Press.

—. 1999. "Environments in Developmental Perspective: Theoretical and Operational Models." Pp. 3-23 in *Measuring Environment across the Life Span: Emerging Methods and Concepts*, edited by S. L. Friedman and T. D. Wachs. Washington DC: American Psychological Association Press.

Burton, Linda M., Townsand Price-Spratlen, and Margaret Beale Spencer. 1997. "On Ways of Thinking About Measuring Neighborhoods: Implications for Studying Context and Development Outcomes for Children." Pp. 132-144 in *Neighborhood Poverty: Vol. 2. Policy Implications in*

Studying Neighborhoods, edited by J. Brooks-Gunn, G. Duncan, and J. Aber. New York: Russell Sage Foundation.
Cairns, Robert B., Lars R. Bergman, and Jerome Kagan. 1998. "Methods and Models for Studying the Individual." Newbury Park: CA: Sage.
Campbell, Karen E. and Barrett A. Lee. 1992. "Sources of Personal Neighborhood Networks: Social Integration, Need, or Time?" *Social Forces* 70:1077-1100.
Choo, Hae Yeon and Myra Marx Ferree. 2010. "Practicing Intersectionality in Sociological Research: A Critical Analysis of Inclusions, Interactions, and Institutions in the Study of Inequalities." *Sociological Theory* 28:129-149.
Clapp, John M. and Yazhen Wang. 2006. "Defining Neighborhood Boundaries: Are Census Tracts Obsolete." *Journal of Urban Economics* 59:259-284.
Clark, William A.V. 2006. "Race, Class, and Space: Outcomes of Suburban Access for Asians and Hispanics." *Urban Geography* 27:589-506.
Clarke, Philippa and Blair Wheaton. 2007. "Addressing Data Sparseness in Contextual Population Research: Using Cluster Analysis to Create Synthetic Neighborhoods." *Sociological Methods & Research* 35:311-351.
Clatworthy, Jane, Deana Buick, Matthew Hankins, John Weinman, and Robert Horne. 2005. "The Use and Reporting of Cluster Analysis in Health Psychology: A Review." *British Journal of Health Psychology* 10:329-358.
Cook, Thomas D., Melissa R. Herman, Meredith Phillips, and Richard A. Settersten, Jr. 2002. "Some Ways in Which Neighborhoods, Nuclear Families, Friendship Groups, and Schools Jointly Affect Changes in Early Adolescent Development." *Child Development* 73:1283-1309.
Crane, Jonathan. 1991. "The Epidemic Theory of Ghettos and Neighborhood Effects on Dropping out and Teenage Childbearing." *The American Journal of Sociology* 96:1226-1259.
Cummins, Steven, Sarah Curtis, Ana V. Diez-Roux, and Sally Macintyre. 2007. "Understanding and Representing 'Place' in Health Research: A Relational Approach." *Social Science & Medicine* 65:1825-1838.
Dannefer, Dale and Jessica A. Kelley-Moore. 2009. "Theorizing the Life Course: New Twists in the Paths." Pp. 389-412 in *Handbook of Theories of Agin, Second Edition*, edited by V. L. Bengtson, M. Silverstein, N. M. Putney, and D. Gans. New York: Springer Publishing Company.
Duncan, Greg J. and J. Lawrence Aber. 1997. "Neighborhood Models and Measures." in *Neighborhood Poverty: Context and Consequences for Children, Volume 1*, edited by J. Brooks-Gunn, G. J. Duncan, and J. L. Aber. New York: Russell Sage Foundation.
Dupere, Veronique and Douglas D. Perkins. 2007. "Community Types and Mental Health: A Multilevel Study of Local Environment Stress and Coping." *American Journal of Community Psychology* 39:107-119.
Dwyer, Rachel E. 2010. "Poverty, Prosperity, and Place: The Shape of Class Segregation in the Age of Extremes." *Social Problems* 57:114-137.
Earls, Felton and Mary Carlson. 2001. "The Social Ecology of Child Health and Well-Being." *Annual Review of Public Health* 22:143-166.
Elder, Glen. 1998. "The Life Course and Human Development." Pp. 939-91 in *Handbook of Child Psychology, Vol.1: Theoretical Models of Human Development*, edited by R. Lerner. New York: Wiley.
Elder, Glen H. 1994. "Time, Human Agency, and Social Change: Perspectives on the Life Course." *Social Psychology Quarterly* 57:4-15.
Elder, Glenn H., Monica Kirkpatrick Johnson, and Robert Crosnoe. 2003. "The Emergence and Development of Life Course Theory." Pp. 3-19 in *Handbook of the Life Course*, edited by J. T. Mortimer and M. J. Shanahan. New York: Kluwer Academic/Plenum Publishers.
Elliott, Delbert S., Scott Menard, Bruce Rankin, Amanda Elliott, William J. Wilson, and David Huizinga. 2006. *Good Kids from Bad Neighborhoods: Successful Development in Social Context*. Cambridge: Cambridge University Press.

Fagan, Jeffrey. 1993. "Editor's Introduction." *Journal of Research in Crime and Delinquency* 30:381-382.
Fauth, Rebecca C., Tama Leventhal, and Jeanne Brooks-Gunn. 2007. "Welcome to the Neighborhood? Long-Term Impacts of Moving to Low-Poverty Neighborhoods on Poor Children's and Adolescents' Outcomes." *Journal of Research on Adolescence* 17:249-284.
Ferraro, Kenneth F., Tetyana Pylypiv Shippee, and Markus H. Schafer. 2009. "Cumulative Inequality Theory for Research on Aging and the Life Course." Pp. 413-433 in *Handbook of Theories of Aging, Second Edition*, edited by V. L. Bengtson, D. Gans, N. M. Putney, and M. Silverstein. New York: Springer Publishing.
Freedman, David A. 1985. "Statistics and the Scientific Method." in *Cohort Analysis in the Social Sciences: Beyond the Identification Problem*, edited by W. M. Mason and S. E. Fienberg. New York: Springer-Verlag.
Friedman, Samantha and Emily Rosenbaum. 2007. "Does Suburban Residence Mean Better Neighborhood Conditions for All Households? Assessing the Influence of Nativity Status and Race/Ethnicity." *Social Science Research* 36:1-27.
Galster, George C. and Sean P. Killen. 1995. "The Geography of Metropolitan Opportunity: A Reconnaissance and Conceptual Framework." *Housing Policy Debate* 6:7-43.
Geis, Karyln J. and Catherine E. Ross. 1998. "A New Look at Urban Alienation: The Effect of Neighborhood Disorder on Perceived Powerlessness." *Social Psychology Quarterly* 61:232-246.
Gershoff, Elizabeth T., Sara Pedersen, and J. Lawrence Aber. 2009. "Creating Neighborhood Typologies of GIS-Based Data in the Absence of Neighborhood-Based Sampling: A Factor and Cluster Analytic Strategy." *Journal of Prevention & Intervention in the Community* 37:35-47.
Gibson, Chris L., Sara Z. Morris, and Kevin M. Beaver. 2009. "Secondary Exposure to Violence During Childhood and Adolescence: Does Neighborhood Context Matter?" *Justice Quarterly* 26:30-57.
Gordon-Larsen, Penny. 2008. "National Longitudinal Study of Adolescent Health (Add Health), 1994-2002: Obesity and Neighborhood Environment Files."
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.
Grannis, Rick. 1998. "The Importance of Trivial Streets: Residential Streets and Residential Segregation." *American Journal of Sociology* 102(6):1530-1564.
Greenman, Emily and Yu Xie. 2008. "Is Assimilation Theory Dead? The Effect of Assimilation on Adolescent Well-Being." *Social Science Research* 37:109-137.
Gross, Kennen S. and Paul A. McDermott. 2008. "Use of City-Archival Data to Inform Dimensional Structure of Neighborhoods." *Journal of Urban Health* 86:161-182.
Hart, L. Gary, Eric H. Larson, and Denise M. Lishner. 2005. "Rural Definitions for Health Policy and Research." *American Journal of Public Health* 95:1149-1155.
Hayes-Smith, Justin and Rachel Bridges Whaley. 2009. "Community Characteristics and Methamphetamine Use: A Social Disorganization Perspective." *Journal of Drug Issues* 39:547-576.
Haynie, Dana L., Eric Silver, and Brent Teasdale. 2006. "Neighborhood Characteristics, Peer Networks, and Adolescent Violence." *Journal of Quantitative Criminology* 22:147-169.
Hipp, John R. 2007. "Block, Tract, and Levels of Aggregation: Neighborhood Structure and Crime and Disorder as a Case in Point." *American Sociological Review* 72:659-680.
Iceland, John and Kyle Ann Nelson. 2008. "Hispanic Segregation in Metropolitan America: Exploring Multiple Forms of Spatial Assimilation." *American Sociological Review* 73:741-765.
Iceland, John, Cicely Sharpe, and Erika Steinmetz. 2005. "Class Differences in African American Residential Patterns in U.S. Metropolitan Areas: 1990-2000." *Social Science Research* 34:252-266.
Jencks, Christopher and S. 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. a. M. Lynn.

Jensen, Leif, Diane K. McLaughlin, and Timothy Slack. 2003. "Rural Poverty: The Persisting Challenge." Pp. 118-131 in *Challenges for Rural America in the Twenty-First Century*, edited by D. L. Brown and L. E. Swanson. University Park, PA: Penn State University Press.

Johnson, Rucker C. 2011. "The Place of Race in Health Disparities: How Family Background and Neighborhood Conditions in Childhood Impact Later-Life Health." Pp. 18-36 in *Neighborhood and Life Chances: How Place Matters in Modern America*, edited by H. B. Newburger, E. L. Birch, and S. M. Wachter. Philadelphia, PA: University of Pennsylvania Press.

Korbin, Jill E. and Claudia J. Coulton. 1997. "Understanding the Neighborhood Context for Children and Families: Combining Epidemiological and Ethnographic Approaches." Pp. 65-79 in *Neighborhood Poverty, Volume 2: Policy Implications in Studying Neighborhoods*, edited by J. Brooks-Gunn, G. J. Duncan, and J. L. Aber. New York: Russell Sage Foundation.

Land, Kenneth C., Patricia L. McCall, and Lawrence E. Cohen. 1990. "Structural Covariates of Homicide Rates: Are There Any Invariances across Time and Social Space." *American Journal of Sociology* 95:922-963.

Lee, Barrett A. and Matthew Marlay. 2007. "The Right Side of the Tracks: Affluent Neighborhoods in the Metropolitan United States." *Social Science Quarterly* 88:766-789.

Lee, Matthew R., William B. Bankston, Timothy C. Hayes, and Shaun A. Thomas. 2007. "Revisiting the Southern Culture of Violence." *The Sociological Quarterly* 48:253-275.

Leventhal, Tama and Jeanne Brooks-Gunn. 2000. "The Neighborhoods They Live In: The Effects of Neighborhood Residence on Child and Adolescent Outcomes." *Psychological Bulletin* 126:309-337.

Li, Yu-Sheng and Ying-Chih Chuang. 2008. "Neighborhood Effects on an Individual's Health Using Neighborhood Measurements Developed by Factor Analysis and Cluster Analysis." *Journal of Urban Health* 86:5-18.

Lichter, Daniel T. and Kenneth M. Johnson. 2007. "The Changing Spatial Concentration of America's Rural Poor Population." *Rural Sociology* 72:331-358.

Liska, Allen F., John R. Logan, and Paul E. Bellair. 1998. "Race and Violent Crime in the Suburbs." *American Sociological Review* 63:27-38.

Lobao, Linda. 2004. "Continuity and Change in Place Stratification: Spatial Inequality and Middle-Range Territorial Units." *Rural Sociology* 69:1-30.

Lobao, Linda M. and Gregory Hooks. 2007. "Advancing the Sociology of Spatial Inequality: Spaces, Places, and the Subnational Scale." Pp. 29-61 in *The Sociology of Spatial Inequality*, edited by L. M. Lobao, G. Hooks, and A. R. Tickamyer. Albany, NY: State University of New York Press.

Lobao, Linda M., Gregory Hooks, and Ann R. Tickamyer. 2007. "Advancing the Sociology of Spatial Inequality." Pp. 1-28 in *The Sociology of Spatial Inequality*, edited by L. M. Lobao, G. Hooks, and A. R. Tickamyer. Albany, NY: State University of New York Press.

Logan, John R., Wenquan Zhang, and Richard D. Alba. 2002. "Immigrant Enclaves and Ethnic Communities in New York and Los Angeles." *American Sociological Review* 67:299-322.

Lorr, Maurice. 1983. *Cluster Analysis for Social Scientists*. San Francisco: Jossey-Bass Publishers.

Luke, Douglas A. 2005. "Getting the Big Picture in Community Science: Methods That Capture Context." *American Journal of Community Psychology* 35:185-199.

Marsh, Herbert W., Oliver Ludtke, Ulrich Trautwein, and Alexandre J.S. Morin. 2009. "Classical Latent Profile Analysis of Academic Self-Concept Dimensions: Synergy of Person- and Variable-Centered Approaches to Theoretical Models of Self-Concept." *Structural Equation Modeling* 16:191-225.

Massey, Douglas S. 1996. "The Age of Extremes: Concetrated Affluence and Poverty in the Twenty-First Century." *Demography* 33:395-412.

—. 2001. "The Prodigal Paradigm Returns: Ecology Comes Back to Sociology." in *Does It Take a Village? Community Effects on Children, Adolescents, and Families*, edited by A. Booth and A. C. Crouter. Mahwah, NJ: Lawrence Erlbaum.

Massey, Douglas S. and Mary J. Fischer. 2001. "Segregation of Asians in U.S. Metropolitan Areas: 1980-1990." *EurAmerica* 31:431-460.
Massey, Douglas S., Jonathan Rothwell, and Thurston Domina. 2009. "The Changing Bases of Segregation in the United States." *Annals of AAPSS* 626:74-90.
Milligan, Glenn W. and Martha C. Cooper. 1985. "An Examination of Procedures for Determining the Number of Clusters in a Data Set." *Psychometrika* 50:159-179.
Morenoff, Jeffrey D. and Robert J. Sampson. 1997. "Violent Crime and Spatial Dynamics of Neighborhood Transition: Chicago, 1970-1990." *Social Forces* 76:31-64.
Morenoff, Jeffrey D., Robert J. Sampson, and Stephen W. Raudenbush. 2001. "Neighborhood Inequality, Collective Efficacy, and the Spatial Dynamics of Urban Violence." *Criminology* 39:517-559.
Morenoff, Jeffrey D. and Marta Tienda. 1997. "Underclass Neighborhoods in Temporal and Ecological Perspective." *Annals of AAPSS* 551:59-72.
Murphy, Alexandra K. 2007. "The Suburban Ghetto: The Legacy of Herbert Gans in Understanding the Experience of Poverty in Recently Impoverished American Suburbs." *City & Community* 6:21-37.
Nau, Claudia L. 2011. "A Census Data Based Simulation Experiment on the Effects of Modeling Neighborhood Effects on a Health Outcome At "The Wrong" Scale of Census Geography." Paper presented at the annual meeting of the Population Association of America, Washington, DC.
Nelson, Melissa C., Penny Gordon-Larsen, Yang Song, and Barry M. Popkin. 2006. "Built and Social Environments: Associations with Adolescent Overweight and Activity." *American Journal of Preventative Medicine* 31:109-117.
O'Rand, Angela M. 2001. "Stratification and the Life Course: The Forms of Life-Course Capital and Their Interrelationships." Pp. 197-213 in *Handbook of Aging and the Social Sciences 5th Edition*, edited by R. H. Binstock and L. K. George. San Diego, CA: Academic Press.
Pattillo, Mary. 2005. "Black Middle-Class Neighborhoods." *Annual Review of Sociology* 31:305-329.
Plybon, Laura E. and Wendy Kliewer. 2002. "Neighborhood Types and Externalizing Behavior in Urban School-Age Children: Tests of Direct, Mediated, and Moderated Effects." *Journal of Child and Family Studies* 10:419-437.
Ramirez, Roberto R. 2004. "We Are the People: Hispanics in the United States." Census 2000 Special Reports, CENSR-18, U.S. Census Bureau, Washington DC.
Rapkin, Bruce D. and Douglas A. Luke. 1993. "Cluster Analysis in Community Research: Epistemology and Practice." *American Journal of Community Psychology* 21:247-277.
Robert, Stephanie A. 1999. "Socioeconomic Position and Health: The Independent Contribution of Community Socioeconomic Context." *Annual Review of Sociology* 25:489-516.
Roscigno, Vincent J. and Martha L. Crowley. 2001. "Rurality, Institutional Disadvantage, and Achievement/Attainment." *Rural Sociology* 66:268-292.
Sampson, Robert J. 1993. "Linking Time and Place: Dynamic Contextualism and the Future of Criminological Inquiry." *Journal of Research in Crime and Delinquency* 30:426-444.
Sampson, Robert J. and Jeffrey D. Morenoff. 1997. "Ecological Perspectives on the Neighborhood Context of Urban Poverty: Past and Present." Pp. 1-22 in *Neighborhood Poverty: Policy Implications in Studying Neighborhoods*, edited by J. Brooks-Gunn, G. J. Duncan, and J. L. Aber. New York: Russell Sage Foundation.
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* 51:443-478.
Sampson, Robert J. and Stephen W. Raudenbush. 1999. "Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods." *American Journal of Sociology* 48:603-651.
Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls. 1997. "Neighborhoods and Violent Crime: A Multi-Level Study of Collective Efficacy." *Science* 277:918-924.
Sarle, W.S. 1983. "Cubic Clustering Criterion. SAS Technical Report a-108." SAS Institute Inc., Cary, NC.

SAS/STAT User's Guide. 2008. Cary, NC: SAS Institute.
Schulz, Amy J., Shannon N. Zenk, Barbara A. Israel, Graciela Mentz, Carmen Stokes, and Sandro Galea. 2008. "Do Neighborhood Economic Characteristics, Racial Composition, and Residential Stability Predict Perceptions of Stress Associated with the Physical and Social Environment? Findings from a Multilevel Analysis in Detroit." *Journal of Urban Health* 85:642-661.
Settersten, Richard A., Jr. and Tanetta E. Andersson. 2002. "Moving and Still: Neighborhoods, Human Development, and the Life Course." *Advances in Life Course Research* 7:197-227.
Settersten, Richard A., Jr. and Lynn Gannon. 2005. "Stucture, Agency, and the Space Between: On the Challenges and Contradictions of a Blended View of the Life Course." *Advances in Life Course Research* 10:35-55.
Sharkey, Patrick. 2008. "The Intergenerational Transmission of Context." *American Journal of Sociology* 113:931-969.
Shinn, Marybeth and Sioban M. Toohey. 2003. "Community Contexts of Human Welfare." *Annual Review of Psychology* 54:427-459.
Simons, Ronald L., Leslie Gordon Simons, Callie Harbin Burt, Gene H. Brody, and Carolyn Cutron. 2005. "Collective Efficacy, Authoritative Parenting and Delinquency: A Longitudinal Test of a Model Integrating Community- and Family-Level Processes." *Criminology* 43:989-1029.
Snedker, Karen A., Jerald R. Herting, and Emily Walton. 2009. "Contextual Effects and Adolescent Substance Use: Exploring the Role of Neighborhoods." *Social Science Quarterly* 90:1272-1297.
South, Scott J. and Eric P. Baumer. 2000. "Deciphering Community and Race Effects on Adolescent Premarital Childbearing." *Social Forces* 78:1379-1408.
Spencer, Margaret Beale, Paul A. McDermott, Linda M. Burton, and Tedd Jay Kochman. 1997. "An Alternative Approach to Assessing Neighborhood Effects on Early Adolescent Achievement and Problem Behavior." Pp. 145-163 in *Neighborhood Poverty: Policy Implications in Studying Neighborhoods*, edited by J. Brooks-Gunn, G. J. Duncan, and J. L. Aber. New York: Russell Sage Foundation.
Sucoff, Clea A. and Dawn M. Upchurch. 1998. "Neighborhood Context and the Risk of Childbearing among Metropolitan-Area Black Adolescents." *American Sociological Review* 63:571-585.
Tickameyer, Ann R. and Cynthia M. Duncan. 1990. "Poverty and Oppourtunity Structure in Rural America." *Annual Review of Sociology* 16:67-86.
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: Sage Publications.
U.S. Census Bureau. 1995. "Urban and Rural Definitions." http://www.census.gov/geo/www/ua/urdef.txt.
—. 2001. "Census 2000 Summary File 1 Technical Documentation, Prepared by the U.S. Census Bureau."
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 Family* 61:920-933.
Vermunt, Jeroen K. 2008. "Latent Class and Finite Mixture Models for Multilevel Data Sets." *Statistical Methods in Medical Research* 17:33-51.
Warner, Barbara D. and Pamela Wilcox Rountree. 1997. "Local Social Ties in a Community and Crime Model: Questioning the Systemic Nature of Informal Social Control." *Social Problems* 44:520-536.
Weisheit, Ralph A. and L. Edward Wells. 2005. "Deadly Violence in the Heartland: Comparing Homicide Patterns in Nonmetropolitan and Metropolitan Counties." *Homicide Studies* 9:55-80.
Wilcox, Pamela. 2003. "An Ecological Approach to Understanding Youth Smoking Trajectories: Problems and Prospects." *Addiction* 98:57-77.
Wilson, William J. 1987. *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

Table 1. Distribution of Respondents and Census Tracts Within Neighborhood Clusters, Add Health Wave I, Unweighted Frequencies and Percentages

Cluster	N (resp.)	% (resp.)	N (tracts)
1: Poor White urban	1226	5.97	192
2: Poor White rural	3199	15.57	225
3: Poor Black rural	828	4.03	50
4: Poor Black/White urban	1004	4.89	183
5: Poor Black urban	942	4.58	205
6: Poor Hispanic immigrant urban	567	2.76	44
7: Poor/Working class Hispanic urban	746	3.63	185
8: Working class Asian suburban	274	1.33	10
9: Working class Black urban	490	2.38	151
10: Working class White urban	1689	8.22	368
11: Working class White rural	3502	17.04	305
12: Middle class Hispanic/Asian urban	1473	7.17	36
13: Middle class Black suburban/urban	549	2.67	61
14: Middle class White suburban	2730	13.29	212
15: Affluent White suburban	1328	6.46	220
Total	20,547	100.00	2,447

Table 2. Descriptive Characteristics of Neighborhood Clusters, Add Health Wave I, Medians and Ranges (in parentheses), n=20,547 respondents, n=2,447 tracts

	Socioeconomic Status			*Racial/Ethnic Composition*					*Urbanicity/Rurality*
	Low SES	High SES	Median Income (1000s)	% NH White[a]	% NH Black	% Other	% Hispanic	% Foreign Born	Population Density
Observed range, full sample	0.00-0.87	0.00-0.81	4.99-125.05	0.00-100.00	0.00-100.00	0.00-78.38	0.00-96.27	0.00-86.90	0.00-69.17
Cluster									
1: Poor White urban	0.19	0.14	21.00	90.97	2.92	1.74	1.96	2.27	1.65
	0.08-0.87	0.00-0.41	6.84-30.13	47.18-99.74	0.00-35.43	0.00-8.93	0.00-45.04	0.00-28.42	0.14-10.20
2: Poor White rural	0.17	0.14	22.18	93.28	3.53	0.51	0.41	0.82	0.02
	0.05-0.45	0.05-0.40	9.90-32.53	41.24-100.00	0.00-51.18	0.00-37.24	0.00-24.95	0.00-20.50	0.00-0.79
3: Poor Black rural	0.29	0.13	17.37	35.18	64.38	0.36	0.19	0.28	0.02
	0.21-0.50	0.00-0.21	7.62-23.01	7.20-67.11	31.71-77.50	0.00-4.61	0.00-29.60	0.00-56.00	0.00-0.30
4: Poor White/ Black urban	0.27	0.13	18.43	46.02	43.87	1.81	5.77	5.00	2.57
	0.11-0.55	0.04-0.48	7.60-31.82	0.00-93.25	4.38-84.93	0.00-28.44	0.00-45.06	0.00-57.91	0.21-69.17
5: Poor Black urban	0.42	0.10	11.51	6.02	92.65	0.30	0.32	0.49	1.55
	0.14-0.78	0.00-0.35	4.99-32.37	0.00-31.65	63.36-100.00	0.00-15.95	0.00-19.73	0.00-18.83	0.01-54.69
6: Poor Hispanic immigrant urban	0.27	0.15	17.14	8.03	0.23	0.52	91.27	78.73	4.95
	0.16-0.42	0.05-0.27	9.12-31.67	3.06-18.52	0.00-8.96	0.00-1.69	81.36-96.24	50.63-86.90	2.27-13.69
7: Poor/WC Hispanic urban	0.27	0.11	20.41	22.06	3.86	3.48	62.24	29.17	3.29
	0.10-0.56	0.03-0.36	6.08-37.52	0.00-63.00	0.00-57.62	0.00-25.70	22.40-96.27	7.78-68.63	0.04-67.89
8: WC Asian suburban[b]	0.09	0.30	40.74	27.97	0.28	65.34	12.55	14.23	0.08
	0.07-14.72	0.15-0.36	29.96-47.34	11.66-39.57	0.00-14.35	46.99-78.38	6.69-15.22	6.93-33.80	0.01-1.29
9: WC Black urban	0.21	0.21	29.67	2.24	94.95	0.41	0.92	1.79	4.41
	0.09-0.45	0.04-0.43	11.66-50.61	0.00-36.58	59.40-100.00	0.00-11.53	0.00-29.51	0.00-65.24	1.54-61.45
10: WC White urban	0.11	0.32	35.47	67.03	2.32	9.54	13.87	19.48	3.26
	0.00-0.37	0.09-0.58	13.37-60.74	5.76-99.17	0.00-39.46	0.00-78.14	0.24-54.44	0.00-65.27	0.92-30.72
11: WC White rural	0.11	0.23	31.57	95.42	0.63	0.95	1.44	2.37	0.60
	0.05-0.20	0.10-0.55	22.01-40.48	55.76-99.90	0.00-26.89	0.00-11.15	0.00-24.39	0.00-18.62	0.02-10.55
12: MC Hisp/Asian urban[b]	0.13	0.29	41.62	27.42	4.98	32.94	30.02	34.79	2.34
	0.52-24.28	0.11-0.50	29.77-62.56	9.11-66.12	0.00-24.08	0.00-50.11	10.13-77.02	9.05-61.54	0.05-5.57
13: MC Black suburban/ urban	0.93	0.40	44.16	22.31	69.48	3.29	5.60	7.15	2.17
	0.06-0.24	0.19-0.70	19.88-56.52	4.74-73.46	22.30-88.90	0.00-25.13	0.00-20.35	0.77-32.42	0.31-37.66
14: MC White suburban	0.83	0.30	38.56	96.44	0.56	0.78	1.30	2.89	0.14
	0.02-0.16	0.18-0.76	27.03-125.05	48.55-99.87	0.00-26.82	0.00-28.41	0.00-28.29	0.00-27.20	0.00-0.86
15: Affluent White suburban	0.06	0.50	50.40	88.83	2.67	2.25	1.46	4.69	1.07
	0.02-14.96	0.21-0.81	34.82-123.73	49.18-100.00	0.00-24.70	0.00-28.46	0.00-28.52	0.45-28.36	0.22-28.49

Notes: WC = working class; MC = middle class; [a]% NH White was not used in the cluster analysis; shown for descriptive purposes only
[b]Among survey respondents in Cluster 8, 66.1% are Asian; among those in Cluster 12, 80.1% are Hispanic or Asian

Table 3. Distribution of Respondents Across Neighborhood Types. Cross-Classification of Neighborhood Cluster Racial/Ethnic Composition by Respondent Race/Ethnicity (in parentheses), Add Health Wave I, Unweighted Percentages

	White		Black		Hispanic		Asian		American Indian/Other		*Within Cluster Total*
Cluster											
1: Poor White urban	69.41	(7.95)	11.75	(3.18)	14.60	(5.11)	1.96	(1.72)	2.12	(6.70)	100%
2: Poor White rural	74.46	(22.26)	18.13	(12.80)	4.13	(3.77)	0.84	(1.94)	2.41	(19.85)	100%
3: Poor Black rural	25.72	(1.99)	72.46	(13.24)	1.09	(0.26)	0.00	(0.00)	0.72	(1.55)	100%
4: Poor Black/White urban	20.82	(1.95)	57.67	(12.77)	15.14	(4.34)	3.98	(2.87)	2.19	(5.67)	100%
5: Poor Black urban	1.70	(0.15)	94.27	(19.59)	2.34	(0.63)	0.32	(0.22)	1.27	(3.09)	100%
6: Poor Hispanic immigrant urban	1.06	(0.06)	0.35	(0.04)	97.00	(15.70)	1.06	(0.43)	0.35	(0.52)	100%
7: Poor/Working class Hispanic urban	9.52	(0.66)	9.52	(1.57)	72.65	(15.47)	6.70	(3.59)	1.47	(2.84)	100%
8: Working class Asian suburban	17.88	(0.46)	1.82	(0.11)	11.68	(0.91)	66.06	(13.00)	2.55	(1.80)	100%
9: Working class Black urban	2.04	(0.09)	90.41	(9.77)	5.10	(0.71)	0.20	(0.07)	2.04	(2.58)	100%
10: Working class White urban	37.66	(5.94)	9.41	(3.51)	30.55	(14.73)	18.18	(22.05)	3.73	(16.24)	100%
11: Working class White rural	82.07	(26.86)	6.54	(5.05)	7.94	(7.93)	1.97	(4.96)	1.46	(13.14)	100%
12: Middle class Hispanic/Asian urban	6.99	(0.96)	10.52	(3.42)	45.35	(19.06)	34.76	(36.78)	2.04	(7.73)	100%
13: Middle class Black suburban/urban	6.56	(0.34)	78.69	(9.53)	11.29	(1.77)	1.82	(0.72)	1.46	(2.06)	100%
14: Middle class White suburban	83.22	(21.23)	4.95	(2.98)	7.44	(5.79)	2.71	(5.32)	1.54	(10.82)	100%
15: Affluent White suburban	73.19	(9.08)	8.36	(2.45)	10.09	(3.82)	6.63	(6.32)	1.58	(5.41)	100%
Racial/ethnic composition of sample	52.08%		22.06%		17.05%		6.77%		1.89%		100%
Within Race Total	(100%)		(100%)		(100%)		(100%)		(100%)		

Note: Survey respondents are coded as non-Hispanic White, non-Hispanic Black, Hispanic, non-Hispanic Asian, or non-Hispanic American Indian/Other

Table 4. Variable-Centered Analysis of the Association Between Neighborhood Characteristics and Adolescent Risk Behaviors: Exposure to Violence, Sexual Activity, and Cigarette Use, Add Health (Wave I, n=18,463)[a,b]

	Model 1	Model 2	Model 3
	Exposure to Violence	Sexual Activity	Cigarette Use
	Exp(β)	Exp(β)	Exp(β)
Intercept	0.039***	0.388*	0.240***
Neighborhood Socioeconomic Characteristics			
Low SES	18.265**	18.412*	11.608*
High SES	1.354	0.683	1.346
Neighborhood Racial/Ethnic Composition			
Proportion non-Hispanic Black	11.351**	8.705*	0.574
Proportion non-Hispanic other race	2.858	1.174	0.442
Proportion Hispanic	7.216***	0.359	0.047***
Proportion foreign born	1.125	1.046	1.786
Neighborhood Population Density			
Population density	1.204***	1.101	1.332**
Interactions			
2-way Interactions			
Low SES X proportion Black	0.032†	0.006*	0.032
Low SES X proportion other	UE	UE	UE
Low SES X proportion Hispanic	UE	UE	UE
Low SES X proportion foreign born	UE	UE	UE
Low SES X population density	1.117	0.945	0.550*
High SES X proportion Black	0.525	0.952	0.260
High SES X proportion other	UE	UE	UE
High SES X proportion Hispanic	UE	UE	UE
High SES X proportion foreign born	UE	UE	UE
High SES X population density	0.919	0.887	0.663
Proportion Foreign born X proportion Black	UE	UE	UE
Proportion Foreign born X proportion other	UE	UE	UE
Proportion Foreign born X proportion Hispanic	UE	UE	UE
Proportion Foreign born X population density	0.835*	0.969	0.949
Population density X proportion Black	1.198	0.951	0.829
Population density X proportion other	0.996	0.784	0.741*
Population density X proportion Hispanic	0.792**	0.988	1.090
3-way Interactions			
Low SES X proportion Black X pop. density	0.491	0.932	1.500
Low SES X proportion other X pop. density	UE	UE	UE
Low SES X proportion Hispanic X pop. density	UE	UE	UE
High SES X proportion Black X pop. density	0.496†	0.897	1.326
High SES X proportion other X pop. density	UE	UE	UE
High SES X proportion Hispanic X pop. density	UE	UE	UE
AIC	14178391	27842606	21973337
Likelihood Ratio χ^2	954106.87***	758869.06***	592971.78***
Wald χ^2	423.11***	101.9845***	147.03***

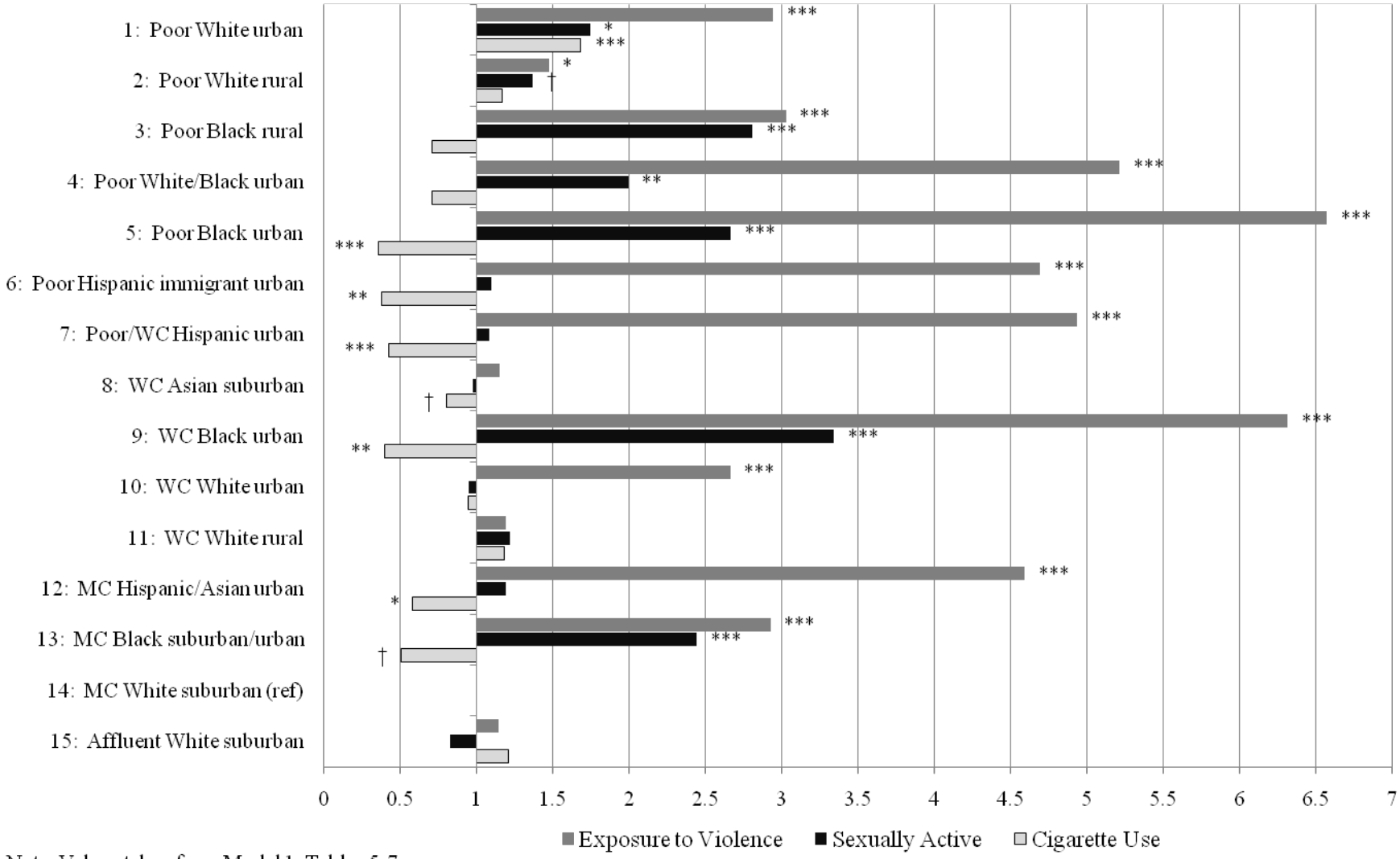
Notes:

† $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a]Models estimated using SAS® SURVEYLOGISTIC procedure to adjust for complex survey design; table presents odds ratios

[b] UE = unable to estimate parameter due to insufficient distribution of data across categories

Figure 1. Predicted Odds of Adolescent Risk Behaviors, by Neighborhood Type



Note: Values taken from Model 1, Tables 5-7

Table 5. Neighborhood-Centered Analysis of the Association Between Neighborhood Type and Adolescent Exposure to Violence, with Rotated Reference Groups, Prevalence Rates and Odds Ratios, Add Health (Wave I, n=18,463)[a]

	Prevalence	Model 1	Model 2	Model 3	Model 4
	%	Exp(β)	Exp(β)	Exp(β)	Exp(β)
Intercept		0.059***	0.174***	0.087***	0.390***
Neighborhood Type					
1: Poor White urban	14.51	2.945***	1.007	1.999***	0.448***
2: Poor White rural	8.60	1.474*	0.504*	—	0.224***
3: Poor Black rural	14.50	3.027***	1.034	2.054**	0.461***
4: Poor White/Black urban	23.37	5.214***	1.782*	3.538***	0.793
5: Poor Black urban	24.45	6.572***	2.246**	4.460**	—
6: Poor Hispanic immigrant urban	16.70	4.694***	1.604	3.185***	0.714
7: Poor/Working class Hispanic urban	23.10	4.937***	1.687†	3.350***	0.751*
8: Working class Asian suburban[b]	5.06	1.150	0.393***	0.780†	0.175***
9: Working class Black urban	24.70	6.317***	2.159*	4.286***	0.961
10: Working class White urban	14.20	2.662***	0.910	1.806*	0.405***
11: Working class White rural	7.61	1.190	0.407**	0.808	0.181***
12: Middle class Hispanic/Asian urban	20.86	4.590***	1.569†	3.115***	0.698**
13: Middle class Black suburban/urban	19.57	2.926***	—	1.985*	0.445**
14: Middle class White suburban	6.26	—	0.342***	0.679*	0.152***
15: Affluent White suburban	8.91	1.144	0.391***	0.776	0.174***
AIC			14261657		
Likelihood Ratio χ^2			870835.36***		
Wald χ^2			1058.94***		

Notes: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests)

[a]Models estimated using SAS® SURVEYLOGISTIC procedure to adjust for complex survey design

[b]Findings should be interpreted with caution due to small sample size of this cluster

Table 6. Neighborhood-Centered Analysis of the Association Between Neighborhood Type and Adolescent Sexual Activity, with Rotated Reference Groups, Prevalence Rates and Odds Ratios, Add Health (Wave I, n=18,463)[a]

	Prevalence	Model 1	Model 2	Model 3	Model 4
	%	Exp(β)	Exp(β)	Exp(β)	Exp(β)
Intercept		0.463***	1.129	0.633***	1.234
Neighborhood Type					
1: Poor White urban	44.11	1.744*	0.715	1.274	0.654†
2: Poor White rural	41.10	1.369†	0.561**	—	0.513**
3: Poor Black rural	53.35	2.809***	1.150	2.052**	1.053
4: Poor White/Black urban	50.18	1.994**	0.816	1.456†	0.747†
5: Poor Black urban	53.95	2.668***	1.093	1.949**	—
6: Poor Hispanic immigrant urban	39.35	1.096	0.449	0.801	0.411
7: Poor/Working class Hispanic urban	37.21	1.082	0.443***	0.790	0.405***
8: Working class Asian suburban[b]	32.91	0.979	0.401***	0.715*	0.367***
9: Working class Black urban	52.73	3.339**	1.367	2.439*	1.251
10: Working class White urban	30.83	0.949	0.389***	0.694†	0.356***
11: Working class White rural	38.62	1.217	0.498**	0.889	0.456***
12: Middle class Hispanic/Asian urban	43.53	1.191	0.488***	0.870	0.446***
13: Middle class Black suburban/urban	52.96	2.442***	—	1.784**	0.915
14: Middle class White suburban	33.44	—	0.410***	0.730†	0.375***
15: Affluent White suburban	27.23	0.825	0.338***	0.603**	0.309***
AIC			28018764		
Likelihood Ratio χ^2			582705.86***		
Wald χ^2			89.23***		

Notes: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests)

[a]Models estimated using SAS® SURVEYLOGISTIC procedure to adjust for complex survey design

[b]Findings should be interpreted with caution due to small sample size of this cluster

Table 7. Neighborhood-Centered Analysis of the Association Between Neighborhood Type and Adolescent Cigarette Use, with Rotated Reference Groups, Prevalence Rates and Odds Ratios, Add Health (Wave I, n=18,463)[a]

	Prevalence	Model 1	Model 2	Model 3	Model 4
	%	Exp(β)	Exp(β)	Exp(β)	Exp(β)
Intercept		0.273***	0.138***	0.319***	0.098***
Neighborhood Type					
1: Poor White urban	29.88	1.685**	3.328**	1.444*	4.713***
2: Poor White rural	23.57	1.167	2.305*	—	3.264***
3: Poor Black rural	13.54	0.706	1.396	0.606*	1.976*
4: Poor White/Black urban	14.71	0.710	1.403	0.609*	1.987**
5: Poor Black urban	6.99	0.357***	0.706	0.306***	—
6: Poor Hispanic immigrant urban	8.25	0.377**	0.75	0.323**	1.055
7: Poor/Working class Hispanic urban	13.95	0.427***	0.843	0.366***	1.194
8: Working class Asian suburban[b]	18.99	0.806†	1.593	0.691**	2.256***
9: Working class Black urban	6.65	0.398**	0.786	0.341***	1.113
10: Working class White urban	18.74	0.944	1.865†	0.809	2.641***
11: Working class White rural	25.89	1.182	2.334*	1.013	3.306***
12: Middle class Hispanic/Asian urban	16.19	0.583*	1.152	0.500**	1.631
13: Middle class Black suburban/urban	9.49	0.506†	—	0.434*	1.416
14: Middle class White suburban	21.72	—	1.976†	0.857	2.797***
15: Affluent White suburban	20.67	1.208	2.386*	1.035	3.379***
AIC			22142362		
Likelihood Ratio χ^2			423940.66***		
Wald χ^2			93.41***		

Notes: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests)

[a]Models estimated using SAS® SURVEYLOGISTIC procedure to adjust for complex survey design

[b]Findings should be interpreted with caution due to small sample size of this cluster

Appendix Table. Exploratory Factor Analysis of Census Tract Variables, Add Health, Wave I, Rotated Factor Pattern (Varimax Rotation)

Tract-Level Measures[a]	Factor 1 Low SES	Factor 2 High SES	Factor 3 Racial/ethnic heterogeneity	Factor 4 Residential Stability
Non-Hispanic Black residents	0.87	0.06	-0.12	0.12
Non-Hispanic White residents	-0.65	0.09	-0.61	0.07
Female-headed households	**0.87**	-0.12	-0.10	-0.29
Families with incomes < $15,000	**0.72**	-0.54	-0.06	-0.24
Residents with incomes in 1989 < poverty level	**0.77**	-0.47	-0.01	-0.24
Residents age 25+ without high school diploma or equivalent	**0.48**	-0.74	0.37	-0.02
Unemployment rate	**0.75**	-0.41	0.01	-0.09
Households receiving public assistance	**0.78**	-0.43	0.16	-0.07
Residents employed in blue collar (e.g., manufacturing) occupations	-0.01	-0.89	0.01	0.19
Residents age 25+ with high school education	-0.43	-0.14	-0.62	0.09
Residents age 25+ with college degree or higher	-0.20	**0.92**	0.06	-0.05
Residents employed in professional/managerial occupations	-0.17	**0.92**	-0.08	0.00
Families with incomes > $50,000	-0.33	**0.79**	0.23	0.29
Residents of Hispanic origin	-0.03	-0.27	**0.81**	-0.33
Residents foreign born	-0.06	-0.10	**0.90**	-0.28
Residents Asian/Pacific Islander or some other race	-0.10	0.09	**0.62**	0.10
Housing units vacant	0.09	-0.31	-0.38	-0.24
Housing units rental properties	0.43	-0.06	0.21	-0.81
Housing units owner-occupied	-0.43	0.06	-0.21	**0.81**
Residents age 5+ in same house 5 years prior	0.16	-0.13	0.00	**0.81**

Notes:

[a] Unless otherwise specified, variables are measured as proportion within tract