

# Developmental Psychology

## **Changes in Neighborhood Poverty From 1990 to 2000 and Youth's Problem Behaviors**

Tama Leventhal and Jeanne Brooks-Gunn

Online First Publication, September 12, 2011. doi: 10.1037/a0025314

### CITATION

Leventhal, T., & Brooks-Gunn, J. (2011, September 12). Changes in Neighborhood Poverty From 1990 to 2000 and Youth's Problem Behaviors. *Developmental Psychology*. Advance online publication. doi: 10.1037/a0025314

# Changes in Neighborhood Poverty From 1990 to 2000 and Youth's Problem Behaviors

Tama Leventhal  
Tufts University

Jeanne Brooks-Gunn  
Columbia University

This study used data from the Project on Human Development in Chicago Neighborhoods, a multilevel, longitudinal study of children sampled from 80 diverse neighborhoods, to explore associations among changes in neighborhood poverty from 1990 to 2000 and changes in youth's internalizing problems and property and violent offenses over 6 years ( $N = 3,324$ ; mean age across waves = 12.6 years). After accounting for a host of background characteristics and weighting for the propensity to stay in the original sampled neighborhood, results indicated that neighborhood poverty dynamics were unfavorably linked to boys' problem behaviors. In high-poverty (>30% in 1990) neighborhoods, decreasing poverty was associated with boys' greater internalizing problems and higher probability of increasing in violent behavior than stable neighborhood poverty. In moderate-poverty (20%–30% in 1990) neighborhoods, boys in neighborhoods that got poorer had more internalizing problems than boys in stably poor neighborhoods. Likewise, in low-poverty (<20% in 1990) neighborhoods, increasing poverty was associated with boys' higher probability of increasing in violent behavior than stable neighborhood poverty. Effect sizes were larger in high- and moderate-poverty neighborhoods than in low-poverty neighborhoods. This study complements the neighborhood mobility literature and has implications for interventions aimed at community revitalization.

*Keywords:* neighborhood, poverty, problem behaviors, gender, policy

Demographic trends of rising economic segregation at the neighborhood level (Jargowsky, 1997; Massey, 1996; Wilson, 1996) focused research and policy attention on youth living in neighborhoods characterized by high concentrations of poor families. Recognizing the challenges that many families encounter in relocating out of highly concentrated poor neighborhoods (Goetz, 2003; South & Crowder, 1998), housing mobility programs provide some low-income families the opportunity to move out of these neighborhoods into low-poverty neighborhoods. However, these programs reach only a very limited range of their target population. The Moving to Opportunity for Fair Housing Demon-

stration (MTO) is the most recent and well-known example of such an effort, and the findings to date are mixed, with favorable program effects for girls' mental health and problem behaviors but some negative effects for boys in these domains (Kling, Liebman, & Katz, 2007).

An alternative and potentially wider reaching approach to addressing poverty concentration is to alter the current composition of poor neighborhoods to change the mix and reduce concentrated poverty. This place-based strategy may involve government intervention, private investment, or some combination of both (Kubisch et al., 2002). Reductions in neighborhood poverty may also occur naturally through the in-migration of nonpoor families or through changes in the socioeconomic circumstances of current residents and possibly their out-migration (Freeman, 2005; Vigdor, 2002; Wilson, 1987). In contrast to housing mobility programs, almost no systematic research exists on links between neighborhood poverty declines and youth well-being. The Harlem Children's Zone (HCZ) is the most recent and well-known example of a place-based intervention that provides an array of services to children and families comparable to those typically found in higher income communities, though without altering neighborhood poverty per se. Emerging results suggest that this approach may be a promising avenue for promoting wide-reaching educational benefits for children and youth (Dobbie & Fryer, 2011). Clearly, additional work is needed to explore place-based approaches to addressing neighborhood poverty concentration because of the potential direction and scope of effects that may occur in contrast to those of mobility programs—that is, uniformly positive as opposed to mixed effects and large as opposed to modest in reach.

This study used data from the Project on Human Development in Chicago Neighborhoods (PHDCN), a multilevel, longitudinal

---

Tama Leventhal, Eliot-Pearson Department of Child Development, Tufts University; Jeanne Brooks-Gunn, National Center for Children and Families, Teachers College and College of Physicians and Surgeons, Columbia University.

We would like to acknowledge the primary funders of the Project on Human Development in Chicago Neighborhoods including the John D. and Catherine T. MacArthur Foundation, the National Institute of Justice, and the National Institute of Mental Health. Additional support was provided to Tama Leventhal by the U.S. Department of Housing and Urban Development Postdoctoral Urban Scholars Program and the William T. Grant Foundation Scholars Program. The findings reported in this article do not necessarily represent the views of the funders. We also are grateful to Veronique Dupere for analytic assistance and feedback, Sara Anderson for assistance with manuscript preparation, and Robert Crosnoe and Sandra Newman for helpful advice.

Correspondence concerning this article should be addressed to Tama Leventhal, Eliot-Pearson Department of Child Development, Tufts University, 105 College Avenue, Medford, MA 02155. E-mail: tama.leventhal@tufts.edu

study of children sampled from 80 diverse neighborhoods, to explore associations among neighborhood poverty change—as measured by the U.S. census from 1990 to 2000—and youth’s internalizing problems and delinquency (property and violent offenses) trajectories over 6 years. Chicago was marked by declines in poverty concentration during the last decade, particularly in high-poverty areas (Jargowsky, 2003; Kingsley & Pettit, 2003). Although the factors that contributed to this transformation are varied (within and between neighborhoods) and cannot be isolated in this study, Chicago provides a context for examining links between decreases in neighborhood poverty and youth’s development. Because neighborhood poverty can increase as well as decrease, we explore both types of changes and their associations with youth’s development. We examine associations as a function of initial neighborhood poverty status in 1990 (high, moderate, or low) and gender.

## Background

The neighborhoods where children and youth live are recognized as an important context for their development (Huston & Ripke, 2006; Shonkoff & Phillips, 2000; Steinberg & Morris, 2001). A growing body of research has used data collected from the U.S. decennial census to examine links between neighborhood poverty (i.e., the percentage of households in a census tract or block group that live below the federal poverty threshold) or low socioeconomic status (SES; e.g., combination of percentage poor, unemployed, receiving welfare, and/or single-parent households) and a range of child and youth outcomes. What this work reveals is that after covarying for family background, neighborhood poverty or low SES is adversely associated with children’s and youth’s socioemotional and behavioral outcomes and to a lesser extent their school achievement (Burton & Jarrett, 2000; Leventhal, Dupéré, & Brooks-Gunn, 2009; Sampson, Morenoff, & Gannon-Rowley, 2002).

A majority of the research documenting associations between neighborhood poverty and youth’s development is either cross-sectional or based on neighborhood residence at a single point in time (Jackson & Mare, 2007; Leventhal & Brooks-Gunn, 2001). By not examining changes in neighborhood contexts, extant work has resulted in a static view of associations between neighborhood poverty and children’s development and a limited understanding of how changes in neighborhood poverty may be linked to their development. We review here relevant theoretical and empirical research on how neighborhood poverty changes may be associated with youth’s development in high-, moderate-, and low-poverty neighborhoods in turn.

## High-Poverty Neighborhoods

Research on changes in poverty within high-poverty neighborhoods, typically those where more than 30%–40% of households live below the federal poverty threshold, has centered on “gentrification” or decreasing socioeconomic disadvantage in urban areas. A majority of this work examines spontaneously occurring gentrification (rather than public or private investment). During the period from 1990 to 2000, the focus of this study, Ellen and O’Regan (2008) pointed to several competing forces that may have driven widespread gentrification of high-poverty neighborhoods: a

strong economy; changes in welfare and income support policies that benefited low-income workers; expansion of mortgage lending among the low income, fostering homeownership in poor neighborhoods; shifts in approaches to federal housing policy away from concentrating poor families in high-poverty, central city neighborhoods; and reductions in crime in high-poverty neighborhoods, making them more appealing places of residence. These different forces served to alter the composition of high-poverty neighborhoods by simultaneously raising the fortunes of current residents and bringing new, more advantaged residents to these same neighborhoods, often referred to as gentrification.

Gentrification typically entails changes in several neighborhood structural features from the influx of new residents including increases in the composition of affluent, European American, professional, and/or college-educated residents (Freeman, 2005; Grasmuck, 2003; Vigdor, 2002). Although decreases in neighborhood-level poverty per se have not been a focus of this work, concern has been raised about the out-migration of low-income residents, particularly whether they are displaced (Freeman, 2002; Kennedy & Leonard, 2001; Popkin et al., 2002; Salama, 1999). Several rigorously conducted analyses find converging evidence that low-income residents are no more likely to leave gentrifying neighborhoods than nongentrifying neighborhoods and, in fact, may be more likely to stay in gentrifying neighborhoods (Freeman & Braconi, 2004; McKinnish, Walsh, & White, 2010; Vigdor, 2002). As such, youth living in high-poverty neighborhoods in the midst of gentrification are likely to be exposed to internal neighborhood dynamics with potential implications for their development.

The literature on gentrification in high-poverty neighborhoods generally has not considered its potential association with children’s development. Gentrification, especially if it co-occurs with residential and commercial investment (public or private), may alter several neighborhood processes that could influence youth (Briggs, Mueller, & Sullivan, 1997). It may bring more institutional resources (e.g., good-quality schools, youth programs, jobs, police) and amenities (e.g., supermarkets, restaurants, theaters) to neighborhoods, which could benefit a range of youth outcomes as long as low-income residents have access to them (Leventhal et al., 2009). For example, findings from the HCZ revealed that charter schools rather than other community services were likely responsible for the gain in poor, minority children’s achievement (Dobbie & Fryer, 2011). In a similar vein, a study using national data reported that African American youth who lived in neighborhoods that declined in concentrated disadvantage (poverty and associated conditions such as welfare receipt, unemployment, etc.) from 1980 to 1990 had higher economic attainment as adults than a matched sample who lived in neighborhoods not declining in disadvantage (Sharkey, in press). Although this study did not identify the factors that contributed to adult economic attainment, it too suggests potential benefits for youth who live in neighborhoods with decreasing poverty.

Social processes within high-poverty neighborhoods are also likely to be altered by decreasing poverty. Physical disorder (e.g., deteriorating housing), crime, and violence may decline in these neighborhoods (Brueckner & Rosenthal, 2009). These processes are linked to youth’s socioemotional and behavioral outcomes (Sampson et al., 2002), indicating that decreasing poverty may benefit youth well-being in these domains. On the potential down-

side, neighborhoods experiencing decreasing poverty, where residents are composed of mixed economic and racial/ethnic background, may have low social integration, resulting in low social cohesion and few social ties among residents (Korbin & Coulton, 1997; Sampson, 2001). Youth well-being may be undermined in such situations, leading to engagement in problem behaviors, despite decreasing poverty. One recent study investigating gentrification (defined with respect to increased housing investments) and neighborhood crime rates in Seattle found a nonlinear relationship; in the early stages of gentrification (1980–1990), it was associated with increased crime (total and property), but as the process took hold over time (1990–2000), it was associated with decreases in crime (Kreager, Lyons, & Hays, in press). Thus, youth outcomes are likely to be associated with decreases in poverty, but the extent of neighborhood change may determine whether the consequences are favorable or unfavorable.

### Moderate-Poverty Neighborhoods

Unlike the research on high-poverty neighborhoods, the literature on moderate-poverty neighborhoods, typically those with poverty rates between 20% and 30%, has considered increasing poverty rather than decreasing poverty. Dating back to the 1920s, urban sociologists working within the social disorganization framework focused on how migration into and out of moderately poor neighborhoods led to changes in socioeconomic conditions (Shaw & McKay, 1942). The typical pattern of migration entailed the in-migration of racial/ethnic and immigrant residents and the out-migration of European American residents (Schwirian, 1983).

A majority of this work highlighted the social problems, such as adolescent delinquency, that arise when neighborhood disadvantage increases: specifically rises in poverty, single-parenthood, residential instability, and racial/ethnic heterogeneity. Increasing disadvantage was thought to undermine neighborhood social organization by weakening community institutions, hindering their ability to monitor residents' behavior and maintain order. Recent work in this tradition reveals that increasing poverty lowers a community's ability to come together around shared values and norms regarding child rearing (or "collective efficacy"; Sampson & Morenoff, 2006), with potentially adverse implications for a range of youth behavioral outcomes, from internalizing problems to delinquency and sexual initiation (Browning, Leventhal, & Brooks-Gunn, 2005; Sampson, 1997; Xue, Leventhal, Brooks-Gunn, & Earls, 2005).

### Low-Poverty Neighborhoods

Not surprisingly, much less research has considered changes in neighborhood poverty in low-poverty neighborhoods (i.e., poverty rates of 20% or less) as compared with high- and moderate-poverty neighborhoods. Limited research indicates that when decreases in socioeconomic disadvantage are widespread across a metropolitan area—as they generally were from 1990 to 2000—declines in disadvantage in lower poverty neighborhoods are typically less than in higher poverty neighborhoods (Ellen & O'Regan, 2008; Galster, Cutsinger, & Malenga, 2008; McKinnish et al., 2010). However, increases in poverty are more consequential for low- than high-poverty neighborhoods, but only when increases are quite large (i.e., above 10%). Together, this work suggests that

changes in poverty, notably increases, are not likely to be associated with youth outcomes in low-poverty neighborhoods unless the change is of a large magnitude because of the relative advantage of being in a community that, on average, has higher quality resources and greater social organization than more disadvantaged neighborhoods.

### Gender Differences in Associations Among Changes in Neighborhood Poverty and Children and Adolescents' Development

Existing neighborhood research suggests that neighborhood poverty changes may be differentially associated with youth's problem behaviors as a function of gender, but the nature and source of these differences is unclear. Two qualitative studies of MTO highlight potential mechanisms that may explain why girls benefited from decreases in neighborhood poverty in this mobility program and boys did not. One study points to changes in a gender-specific aspect of neighborhood safety, specifically girls' reductions in fear of sexual harassment, coercion, and rape (Popkin, Leventhal, & Weismann, 2010). The other study points to peer interactions with girls' social networks based on home and school connections that were both more prosocial and less affected by neighborhood change than boys' networks centered outside in the neighborhood and altered more by change and prone to deviant peer influences (Clampet-Lundquist, Edin, Kling, & Duncan, 2006). These studies based on a housing mobility program suggest that decreasing poverty in high-poverty neighborhoods may benefit girls and possibly harm boys.

Further, the nonexperimental literature indicates that boys may be more sensitive to neighborhood influences than girls across neighborhoods of varying poverty levels (Leventhal et al., 2009). Parental control has been hypothesized to play a role in explaining these findings because it modulates adolescents' exposure to neighborhood influences. Parents tend to exert more control over daughters, while granting sons more autonomy (Galambos, Berenbaum, & McHale, 2009; Hilbrecht, Zuzanek, & Mannell, 2008). Gender differences in parenting may arise from efforts to promote gender role socialization including girls' compliance and avoidance of risk (Hagan, Simpson, & Gillis, 1987; Shanahan, McHale, Crouter, & Osgood, 2007). Thus, in contrast to MTO research, nonexperimental studies suggests that boys may be more susceptible to changes in neighborhood poverty than girls because of less parental control, especially in high-poverty neighborhoods (Browning et al., 2005).

### Selection

Despite the handful of experimental studies linking neighborhood poverty to youth outcomes, a majority of evidence comes from nonexperimental studies, which must be evaluated with caution. A number of family characteristics, beyond family income and the like, may underlie both neighborhood choice and youth outcomes, such as parental motivation. That is, neighborhood–youth outcome links may be due to these unmeasured associations (or omitted variable bias). More rigorous analytic designs have been used in nonexperimental neighborhood research to address this selection bias (see Leventhal et al., 2009, for review). Generally, these studies still find significant associations between neigh-

neighborhood characteristics and children's and adolescents' outcomes, but in the absence of random assignment do not rule out the possibility that selection bias remains.

In the case of neighborhood poverty changes, selection occurs not only around residential choice but also around mobility decisions (i.e., whether families choose to stay in neighborhoods undergoing change). Although these decisions are related to neighborhood choice and omitted variable bias, as discussed, the process of changing neighborhood poverty and associated conditions, such as changes in housing costs, crime, and/or school quality, may induce mobility among some families but not others (e.g., Wilson, 1987), leading to systematic differences in families' responses to neighborhood poverty changes. On the other hand, a substantial body of research on residential mobility indicates that more disadvantaged families are more mobile than more advantaged families (South & Crowder, 1997; U.S. Census Bureau, 2009). In this situation, mobility may arise less from responses to neighborhood poverty changes than from unmeasured characteristics similar to those related to residential choice. Regardless of the source, mobility decisions have implications for youth's exposure to neighborhood poverty changes, with stable youth more likely to be affected by internal neighborhood dynamics than mobile youth. Thus, mobility is an issue that needs to be addressed in any analyses linking neighborhood poverty changes to youth outcomes.

### Current Study

In this study, we examined how decreases as well as increases in neighborhood poverty, compared with stable neighborhood poverty, were associated with youth's internalizing problems, property offenses, and violent behavior over 6 years across neighborhoods of varying levels of poverty. For all outcomes, we investigated both intraindividual (or within person) and interindividual (or average between person) differences in youth outcomes. The former represent a more conservative test of neighborhood effects because unmeasured parent and family characteristics are held constant, whereas the latter provide a useful comparison with most extant neighborhood research. In addition, we considered gender as a possible moderator of these associations. An effort was made to address selection bias in terms of neighborhood choice and mobility by employing propensity score methods. On the basis of the theoretical and empirical work presented, we proposed the following limited set of hypotheses.

In high-poverty neighborhoods, we anticipated that decreasing poverty would be most important for youth's problem behaviors such that decreasing poverty would be associated with youth displaying fewer problem behaviors than stable poverty. We hypothesized that these associations would be moderated by gender, but the nature of these differences was unclear based on the conflicting literature. In moderate-poverty neighborhoods, we expected that increasing poverty would be most strongly associated with youth problem behaviors; increasing poverty was hypothesized to be associated with youth's greater problem behaviors compared with stable poverty. Gender differences were anticipated such that boys' behavior would be more susceptible than girls' to increasing poverty. For youth in low-poverty neighborhoods, we did not expect that changes in poverty—increases or decreases—would be associated with their problem behaviors.

## Method

### Study Design

The PHDCN is a multilevel, longitudinal study designed to investigate the role of neighborhood effects on individual development (Leventhal & Brooks-Gunn, 2003). Participants were drawn from a multistage probability sample designed to capture the diversity of Chicago's neighborhoods. At the first stage, 1990 U.S. census data for 847 census tracts comprising the city of Chicago were combined to create 343 neighborhood clusters (NCs), which include two to three geographically contiguous and relatively homogenous census tracts (approximately 8,000 residents). Next, a stratified probability sample of 80 NCs cross-classified by racial/ethnic composition (seven categories including homogeneous and heterogeneous make-ups) and SES (high, medium, and low) was drawn from the 343 NCs. The aim was to have an equal number of NCs in each of the 21 strata that varied by racial/ethnic composition and SES; however, three of the 21 strata were empty: low-SES, predominately White American neighborhoods; high-SES, predominately Latino neighborhoods; and high-SES, mixed Latino and Black neighborhoods.

Within the 80 NCs, approximately 1,000 children falling within each of seven age cohorts (birth, 3, 6, 9, 12, 15, and 18 years) were sampled from randomly selected households ( $N = 6,226$ ). Home-based interviews were conducted three times over a 6-year period (Wave 1 in 1995–1996, Wave 2 in 1998–1999, and Wave 3 in 2000–2001). Of the families seen at Wave 1, the response rate at Wave 2 was 86% and 77% at Wave 3 (Martin & Schoua-Glusberg, 2002).

### Sample

**Children.** The current study used data on children from four age cohorts—6-, 9-, 12-, and 15-year-olds—who were school aged at Wave 1 ( $N = 3,324$ ; see Table 1). By design, substantial overlap exists in the cohort ages across waves, with children ranging from approximately 6-year-olds (Cohort 6 at Wave 1) to 20-year-olds (Cohort 15 at Wave 3). Fifty percent of children were boys, and they were from diverse racial/ethnic and economic backgrounds. Specifically, 35% of youth were African American, 35% were Mexican American, 11% were of other Latino origins, and 18% were European American or of other race/ethnicities. Almost half the children (45%) were from immigrant families. A majority of children's primary caregivers were their biological mothers (84%; hereafter referred to as "mothers"). Mothers' average level of education was a high school diploma. At the time of their children's birth, mothers were, on average, 26 years of age. At the first wave of data collection, 56% of mothers were married and 56% were employed. At this same time, 32% of families received welfare, and average family income to needs was approximately 1.6, which is about 150% of the federal poverty threshold, signifying that, on average, families were low income. At Wave 1, there were 42 ( $SD = 19$ ) youth per NC, and 39% of youth lived in their neighborhoods in 1990 or since birth.

**Neighborhoods.** For the 80 NCs (hereafter referred to as "neighborhoods"), the average poverty rate based on U.S. census data in 1990 was .22 ( $SD = .15$ ), and the average poverty rate in 2000 was .20 ( $SD = .10$ ), and they were significantly correlated

Table 1  
Descriptive Statistics by Mobility Status

Variable	Stayers <sup>a</sup>	Movers	Total
<b>Child characteristics</b>			
Sex (% male)	50.0	49.7	49.9
<b>Age</b>			
At Wave 1	10.33 (3.37)	10.13 (3.33)	10.27 (3.36)
At Wave 2	12.51 (3.42)	12.61 (3.43)	12.54 (3.43)
At Wave 3	15.09 (3.45)	15.11 (3.41)	15.09 (3.44)
<i>M</i>	12.64 (3.40)	12.61 (3.38)	12.63 (3.40)
<b>Race/ethnicity (%)</b>			
African American	32.5***	41.8	35.2
European American/other	19.6***	14.9	18.2
Mexican American	37.4***	30.1	35.3
Other Latino	10.6*	12.3	11.3
Immigrant status (first or second generation; %)	46.7*	42.2	45.4
In neighborhood 1990/birth (%)	43.7***	26.7	38.8
<b>Maternal characteristics</b>			
Age at child's birth	26.22*** (5.92)	24.13 (5.52)	25.62 (5.89)
Completed schooling	2.84 (1.36)	2.86 (1.26)	2.84 (1.33)
Married at Wave 1 (%)	60.0***	44.3	55.5
Change in marital status at Waves 2–3 (%)	19.2***	28.2	21.8
Employed at Wave 1 (%)	58.4***	51.5	56.4
Change employment at Waves 2–3 (%)	37.0***	46.1	39.6
Depressed at Wave 2 (%)	16.9**	21.5	18.2
<b>Family characteristics</b>			
Receive welfare at Wave 1 (%)	29.1***	39.6	32.1
Change in welfare status at Waves 2–3 (%)	30.7***	38.5	33.0
Income to needs at Wave 1	1.66*** (1.27)	1.36 (1.16)	1.59 (1.28)
Mean change income to needs at Waves 2–3	0.13 (.80)	0.17 (0.86)	0.14 (0.82)
<b>Youth outcomes</b>			
Self-report internalizing behavior at Wave 1	7.61* (6.92)	8.13 (7.16)	7.76 (7.00)
Self-report internalizing behavior at Wave 2	8.51*** (7.82)	9.71 (8.22)	8.86 (7.95)
Self-report internalizing behavior at Wave 3	8.74* (7.96)	9.56 (8.24)	8.98 (8.05)
Maternal report internalizing behavior at Wave 1	12.26 (8.17)	13.05 (8.87)	12.48 (8.37)
Maternal report internalizing behavior at Wave 2	11.35 (8.42)	11.40 (7.96)	11.36 (8.29)
Maternal report internalizing behavior at Wave 3	12.23 (8.60)	12.53 (8.50)	12.32 (8.57)
Violent behavior at Wave 1	0.54*** (1.02)	0.69 (1.29)	0.58 (1.11)
Violent behavior at Wave 2	0.41*** (0.86)	0.55 (0.97)	0.44 (0.90)
Violent behavior at Wave 3	0.32* (0.76)	0.37 (0.82)	0.33 (0.78)
Property offenses at Wave 1	0.23* (0.58)	0.29 (0.65)	0.25 (0.60)
Property offenses at Wave 2	0.21* (0.56)	0.27 (0.61)	0.23 (0.57)
Property offenses at Wave 3	0.18 (0.50)	0.17 (0.49)	0.18 (0.50)
Sample size	2,369	955	3,324

Note. Table presents means and standard deviations (in parentheses) with test statistic computed via analysis of variance and percentages with test statistic computed via chi-square.

<sup>a</sup> Significance levels indicate significantly different from mover group.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

( $r = .66, p < .001$ ). To assess change in neighborhood poverty, we calculated a change score based on the difference between the 2000 and 1990 poverty rates for each of the 80 neighborhoods; the average change in poverty was  $-.01$  ( $SD = .11$ ), signifying an average decline in poverty of 1%. Further analysis of the neighborhood change score revealed a distribution with multiple modal values (both above and below the mean) and values skewed toward the tails of the distribution rather than around the mean. This pattern is not surprising given the rather large standard deviation relative to the mean. As such, we decided to examine change separately by neighborhood poverty type because it was one of the key factors driving the multiple modes, as described next. In addition, we employed a categorical approach to defining neighborhood change. Both of these decisions served several purposes including facilitating examination of nonlinear effects of neigh-

borhood change as hypothesized for both neighborhood poverty type and direction of poverty change; enhancing interpretation of findings in line with extant neighborhood research as reviewed; and making the findings policy relevant with respect to known definitions, thresholds, and real world (vs. hypothetical) circumstances. Thus, following commonly used definitions by the U.S. Census Bureau (1995), by the U.S. Department of Agriculture (Peters, 2009), and in the literature (e.g., O'Hare & Mather, 2003; Orr et al., 2003; Wilson, 1987), we classified neighborhoods based on their 1990 poverty rates as low poverty (<20% poor;  $n = 40$ ), moderate poverty (20%–30% poor;  $n = 17$ ), or high poverty (>30% poor;  $n = 23$ ; see Table 2). The smaller number of neighborhoods (and participants) in the moderate-poverty group is partially a function of the smaller poverty range captured by this category. Next, a change in the poverty rate of 5% or more

Table 2  
*Number of Neighborhoods and Participants by Type of Neighborhood Poverty Change and Neighborhood Poverty Group*

Variable	Low poverty (<20%)	Moderate poverty (20%–30%)	High poverty (>30%)
Stable			
Neighborhoods	28	7	5
Participants	1,165	265	245
Decreasing poverty			
Neighborhoods	3	5	18
Participants	64	128	839
Increasing poverty			
Neighborhoods	9	4	0
Participants	399	219	0
Total			
Neighborhoods	40	16	23
Participants	1,628	612	1,084

(approximately one half of a standard deviation) was used to denote a major pattern of change; this definition was used in another study as an indicator of neighborhood change (Galster, Quercia, Cortes, & Malega, 2003) and is comparable in relative magnitude to measures of neighborhood change employed in other research (Ellen & O'Regan, 2008; McKinnish et al., 2010). Thus, a change in the poverty rate of greater than .05 indicated an increase, a change greater than  $-.05$  indicated a decrease, and a change of less than 5% (positive or negative) was indicative of stability. As seen in Table 2 and in line with the descriptive analysis, nonoverlapping distributions across the neighborhood poverty types exist; for the most part, low-poverty neighborhoods stayed the same or had increasing poverty, and in a similar vein, high-poverty neighborhoods stayed the same or had decreasing poverty. Moderate-poverty neighborhoods changed in both directions. These patterns generally reflect the changing demographics seen nationally from 1990 to 2000 as described in the introduction.

## Measures

All individual-level measures on youth and their families were drawn from interviews conducted as part of the cohort study (see Table 1). Interviews were conducted by a highly heterogeneous set of interviewers; subsets of interviewers were bilingual in English and Spanish or Polish. Neighborhood-level measures were assessed by administrative U.S. census data.

**Child characteristics.** We considered five child characteristics: age (in years) at each wave (an age-squared term was included if significant to account for potential nonlinear age effects), gender (girl = 0, boy = 1), race/ethnicity (three dummy codes for African American, Mexican American, other Latino, with European American and other race/ethnicity as omitted referent), immigrant status (0 = third generation or higher, 1 = first or second generation), and whether the youth lived in his or her Wave 1 neighborhood in 1990 or since birth for those children born after 1990 (0 = no, 1 = yes).

**Maternal and family characteristics.** We assessed a range of maternal and family characteristics that are likely to be associated with choice of neighborhood residence as well as residential mobility. On the basis of interviews at Wave 1, we measured

mothers' age at the time of child's birth (in years), educational attainment (1 = *less than high school*, 5 = *BA or higher*), current marital status (not married = 0, married = 1), and current employment status (unemployed = 0, employed = 1). In addition, we examined family income to needs (total annual family income divided by the official poverty threshold for the respective household size for the respective year) and welfare receipt in the past year (no welfare = 0, welfare = 1). To capture changing circumstances over time, we assessed whether there was a change in mothers' marital and employment statuses and family welfare receipt from Waves 1 to 3 (no change = 0, change = 1) and the average change in family income to needs over this period. Finally, the Depression Module of the Composite International Diagnostic Interview–Short Form (Kessler & Mroczek, 1994) was administered to all mothers at Wave 2 to evaluate their mental health in the past year (not depressed = 0, depressed = 1).

**Stayed in neighborhood by Wave 2.** Because poverty change was based on youth's Wave 1 neighborhoods per the study design, we included an indicator variable to designate whether youth stayed in their neighborhoods through at least Wave 2 (moved = 0, stayed = 1).

**Poverty rate.** All analyses controlled for the 1990 poverty rate to reflect the fact that neighborhood poverty types included a range of poverty levels.

**Children's internalizing problems.** At each wave, only the complete internalizing subscale of the Child Behavior Checklist (CBCL; Achenbach, 1991a) and the Youth Self-Report (YSR; Achenbach, 1991b) were administered: the CBCL to Cohorts 6, 9, and 12 across waves and Cohort 15 at Waves 1 and 2; and the YSR to Cohorts 12 and 15 at each wave, Cohort 9 at Waves 2 and 3, and Cohort 6 at Wave 3.<sup>1</sup> Both the CBCL and the YSR were designed to assess behavioral and emotional problems in which the parent or youth, respectively, rates child's behavior during the past 6 months on a 3-point scale from 0 = *not true* to 2 = *often true*. Sample items include "too fearful or anxious" and "unhappy, sad, or depressed." Maternal and self-reported internalizing scores were significantly but modestly correlated ( $r = .22, p < .001$ ).

**Children's delinquency.** Delinquency was assessed at each wave by the Self-Reported Offending Scale (Huizinga, Esbensen, & Weiher, 1991); this measure was administered to Cohorts 9, 12, and 15 across waves and Cohort 6 at Wave 3. Based on previous psychometric work, we examined two types of delinquency: property offenses and violent behavior (Raudenbush, Johnson, & Sampson, 2003). Youth were asked whether they had ever engaged in a particular offense during the past year. Property crimes entailed five items ranging from purposely damaging property to stealing a car. Violent behavior included eight items ranging from hitting someone with whom the youth did not live with the idea of hurting them to attacking someone with a weapon. The two offenses were significantly correlated ( $r = .66, p < .001$ ).

## Mobility Analysis

Because this study is interested in associations between neighborhood poverty changes and youth's problem behaviors among

<sup>1</sup> At Wave 3, the age 15 cohort was administered a modified version of the YSR, the Young Adult Self-Report (Achenbach, 1990, 1997).

those who were exposed to these changes in the 80 sampled neighborhoods, it is important to consider that mobility out of the original Wave 1 neighborhoods occurred in 29% of the sample and was associated to some extent with attrition (families were followed if they moved, but no data were available on their new neighborhoods). Issues around mobility and exposure to poverty changes also arise in mobility programs. For example, in MTO, 66% of the treatment group moved out of their initial low-poverty placement after the 1st year, and 70% of the control group moved out of their original high-poverty neighborhoods without program assistance (Orr et al., 2003). In this sample, mobility was significantly higher among families in high-poverty neighborhoods (32%), like those in MTO, compared with families in moderate- (27%) and low-poverty (27%) neighborhoods ( $p < .05$ ).

Table 1 presents descriptive statistics for the full sample on child, maternal, and family characteristics separately for “stayers” who remained in their Wave 1 neighborhood until at least Wave 2 and “movers” who moved out of their Wave 1 neighborhood prior to Wave 2. In general, youth who stayed in place tended to come from significantly more advantaged families and had significantly fewer problem behaviors than youth who moved. As such, and as noted earlier, all analyses controlled for whether youth stayed in their Wave 1 neighborhood, and additional steps, to be described next, addressed selection.

### Analytic Strategy

Prior to conducting multilevel models, alternative strategies were considered to address potential selection bias due to mobility. One option was to remove movers from the analysis; however, this strategy would yield biased estimates because of the differences between stayers and movers (see Table 1). Alternative approaches, thus, considered mobility, to some extent, as analogous to non-compliance in a randomized clinical trial (Sharkey, in press). The next option considered in this vein, the Heckman correction (Heckman, 1979), confronts the problem of nonrandom sampling (i.e., including only stayers) by using a two-stage model to correct (or rather mitigate) for selection around mobility. This technique has frequently been used to examine the association between employment status and earnings, where data on earnings are based on a nonrandom sample (Arulampalam, 2001). A shortcoming of this approach is that it does not accommodate the hierarchical data structure (other than correcting standard errors). Thus, another strategy considered was to adjust the models for the propensity for families to stay in their neighborhoods to remove some of the bias associated with decisions regarding mobility (Hirano & Imbens, 2001); this step is very similar to the first stage of the Heckman approach. Propensity score models are increasingly used in non-experimental contexts to mimic an experimental design by accounting for “pretreatment” selection into some type of exposure (e.g., neighborhood poverty; Harding, 2003). The challenge of a direct application of propensity score matching is that our selection problem (i.e., mobility) and treatment of interest (i.e., neighborhood poverty change), though cofounded, are distinct variables. Thus, the final analytic strategy, in essence, combined these latter two approaches in a manner that was parsimonious in terms of addressing selection and accommodated the hierarchical data structure. We did so by considering residential stability as the key selection variable in the first part of the analyses, and then in the

second part we adjusted the analysis of neighborhood change based on the selection model (see Sharkey, in press, for an alternative, but complementary, instrumental variable approach for addressing selection out of changing neighborhoods).

To accomplish this task, we generated a propensity score for the likelihood of a youth staying in his or her Wave 1 neighborhood until at least Wave 2 from a logistic regression including child’s sex, race/ethnicity, total maternal-reported behavior problems at Wave 1, and reading achievement at Wave 1; mother’s age at child’s birth, depression, education, marital status, and employment status; family welfare receipt and income to needs; respective status change variables; and neighborhood poverty rate in 1990, change in neighborhood poverty from 1990 to 2000, percent of professionals or managers in neighborhood in 1990, percent of unemployed residents in neighborhood in 1990, percent of African American residents in neighborhood in 1990, percent of Latino residents in neighborhood in 1990, percent of foreign-born residents in neighborhood in 1990, and percent of housing built in the last 20 years in neighborhood in 1990. Thus, differences between individuals with similar propensity values are thought to be a function of the treatment, in this case staying in the Wave 1 neighborhood (and exposure to change), and not potential confounds (Rosenbaum & Rubin, 1983). Appropriate checks on the robustness of the propensity scores were conducted in Stata, and the propensity score was then transformed to create a weight ( $w$ ) that was employed in multilevel models:

$$w[t,x] = t + [1 - t]/[1 - e(x)],$$

where  $e(x)$  is the propensity score,  $t$  is treatment (mobility) status, and  $x$  refers to the covariate (Hirano & Imbens, 2001). The weighting essentially yields a version of “treatment-on-treated effects” for neighborhood poverty change based on whether families stayed in their Wave 1 neighborhoods, with stayers receiving scores of 1 and movers’ scores weighted based on their similarity to matched stayers (see also Crosnoe, 2009; Hirano & Imbens, 2001). All multilevel models were originally run with and without the weight, and results were generally consistent, although the weighted models tended to be more conservative, but not always (see Appendix for a summary of results from selected unweighted models; complete results available upon request). It is important to note, however, that although our propensity score analyses attempt to control more stringently for selection than regression models that simply adjust for covariates, they do not eliminate it as a threat. The extent to which they address selection bias, which can be substantial (Imbens, 2000), is based on the quality of measured covariates and does not supplant randomization.

To examine associations among neighborhood poverty changes and both intra- and interindividual differences in youth outcomes, accounting for child, maternal, family, and neighborhood characteristics, we employed three-level hierarchical linear regression models using hierarchical linear modeling software (Raudenbush & Bryk, 2002). All models were run separately by neighborhood poverty type because of the nonoverlapping distributions. Level 1 modeled intraindividual change over time in outcomes:

$$Y_{ij} = w[\pi_{0ij} + \pi_{1ij}(d_{ij}) + e_{ij}],$$

where  $d_{ij}$  is the age of youth  $i$  in neighborhood  $j$  at time  $t$  minus that youth’s mean age across waves. Thus, the intercept,  $\pi_{0ij}$ ,

represents the expected mean outcome of youth  $i$  in neighborhood  $j$  across all waves. The linear component,  $\pi_{1ij}$ , is the growth rate for youth  $i$  in neighborhood  $j$ ;<sup>2</sup>  $w$  is the propensity score weight; and  $e_{iii}$  is the random effect. One benefit of hierarchical linear modeling is that estimation procedures permit missing data at Level 1 (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004), which occurs in PHDCN because of the overlapping cohort design.

Level 2 modeled interindividual variation in outcomes across waves. The intercept and growth rate parameters from the Level 1 model became outcomes in this model:

$$\pi_{0ij} = \beta_{00j} + \beta_{01j}(\text{AGE}) + \beta_{0cj}(X_{cij}) + r_{0ij}$$

$$\pi_{1ij} = \beta_{10j} + \beta_{11j}(\text{AGE}) + \beta_{1cj}(X_{cij}) + r_{1ij}$$

where AGE was the mean age across all waves, which was centered around the average mean age.  $X_{cij}$  represents the full set of child (age, gender, race/ethnicity, immigrant status, and whether lived in Wave 1 neighborhood since 1990/birth) and maternal and family (mother's age at child's birth, education, marital status, change in marital status, employment status, and change in employment status; family's welfare receipt, change in welfare receipt, income to needs, and change in income to needs; maternal depression; and whether family stayed in neighborhood through Wave 2) covariates. Continuous variables were grand mean centered, and indicator variables were uncentered.  $\beta_{0cj}$  represents associations among covariates and youth mean outcomes, and  $\beta_{1cj}$  represents associations among covariates and the growth rate of youth outcomes; and  $r_{0ij}$  and  $r_{1ij}$  represent the random effects for the intercept and growth rate, respectively. Prior to including covariates, we tested unconditional models to generate the appropriate age and sex terms (e.g., linear age, quadratic age, and age by sex interactions) for inclusion in models for each respective outcome.

Level 3 modeled intra- and interindividual differences between neighborhoods:

$$\beta_{00j} = \gamma_{000} + \gamma_{001}(\text{NEIGH CH}) + \gamma_{002}(\text{POV 1990}) + u_{00j}$$

$$\beta_{10j} = \gamma_{100} + \gamma_{101}(\text{NEIGH CH}) + \gamma_{102}(\text{POV 1990}) + u_{10j}$$

where  $\gamma_{001}$  represents the association between neighborhood change (decreasing or increasing poverty versus stable; a second term was included for moderate-poverty neighborhoods where both types of change were modeled) and the mean level of the outcome;  $\gamma_{101}$  represents the association between neighborhood change and the growth rate of youth outcomes;  $\gamma_{002}$  and  $\gamma_{102}$  represent associations between the 1990 poverty rate (POV 1990) and youth mean outcome and growth rate, respectively; and  $u_{00j}$  and  $u_{10j}$  represent random effects for the intercept and growth rate, respectively. By accounting for variation both within and between neighborhoods, hierarchical models typically yield more reliable estimates of neighborhood effects than nonnested designs.

After running the first set of models for each neighborhood poverty type exploring associations among neighborhood poverty change and each youth outcome including the full set of covariates as described, a second set of models incorporated cross-level interactions between child sex and neighborhood poverty change. That is, at Level 3, NEIGH CH was entered as a predictor on the sex terms (included in  $X_{cij}$ ). Prior to testing these models, an additional model was run to test whether the sex slopes (for both

the intra- and interindividual intercepts) varied significantly between neighborhoods. Additional random effects were included if the sex slopes were significant, and were fixed if they were not. In the case of cross-level interactions, the sex terms were group mean centered to facilitate interpretation. In addition, we originally tested for age interactions with neighborhood poverty change, but very few significant interactions emerged, and these models were omitted from the final set of analyses (available from authors upon request). Because property and violent offenses were nonnormally distributed, a Poisson distribution was specified for these models.

Finally, missing data due to survey or item nonresponse on individual, maternal, and family measures were imputed with a Bayesian-based expectation-maximization algorithm (via PROC MI in SAS 9.0; SAS Institute, 2003). All reported statistics used imputed data.

## Results

Prior to conducting our primary analyses of interest, we ran preliminary unconditional models for all outcomes for the full sample. Results of these analyses indicated significant within-individual and between-neighborhood variation for all outcomes. Intraclass correlations calculated for the continuous outcomes were in line with expected ranges for between-neighborhood variation (maternal-reported internalizing problems = .06 and self-reported internalizing problems = .05). The remainder of the results are presented separately for high-, moderate-, and low-poverty neighborhoods. For each neighborhood type, we begin by presenting descriptive analyses on child, maternal, family, and neighborhood characteristics by type of neighborhood poverty change, followed by the multilevel analyses of primary interest.

### High-Poverty Neighborhoods

**Descriptive findings.** Youth who lived in neighborhoods with decreasing poverty generally came from more advantaged families than youth in stable neighborhoods; however, they had higher mean levels of violent and property offenses (see Table 3). In line with the gentrification literature, neighborhoods with decreasing poverty had significantly fewer poor (marginal) and foreign-born residents in 2000 but marginally more professional residents and new housing than stable neighborhoods (see Table 4).

**Multilevel findings.** Results of multilevel models revealed several significant associations. Specifically, although associations among decreasing poverty and youth maternal-reported internalizing problems were nonsignificant, a significant decreasing poverty by child sex interaction emerged for interindividual differences, but not intraindividual differences (see Table 5). Figure 1 illustrates the results of this interaction; because we also model intraindividual differences, which entail changes in slopes over time, we graph all interactions as a function of age for the sake of consistency and comparability. Findings reveal that decreasing neighborhood poverty had a larger association with boys' internalizing problems than girls'. The difference in mean maternal-reported internalizing problems between boys in neighborhoods

<sup>2</sup> A fixed quadratic term was included in all models because of the limited number of time points. Results are available from the authors upon request.

Table 3  
*Selected Child, Maternal, and Family Characteristics by Type of Neighborhood Poverty Change*

Variable	Low poverty		Moderate poverty			High poverty	
	Stable	Increase	Stable	Increase	Decrease	Stable	Decrease
<b>Child characteristics</b>							
Age at Wave 1	10.36 (3.43)	10.38 (3.38)	10.26 (3.34)	10.08 (3.39)	10.40 (3.25)	10.05 (3.22)	10.18 (3.30)
Gender (% male)	48.8	50.6	47.5	52.1	55.5	53.9	49.5
<b>Race/ethnicity (%)</b>							
African American	37.1	12.3***	34.3	57.5***	19.5**	18.0	89.6***
European American/other	29.5	21.8**	10.2	5.9	9.4	4.9	11.0**
Mexican American	24.3	48.4***	41.1	32.9	43.8	64.9	34.0**
Other Latino	9.2	17.5***	14.3	3.7***	27.3**	12.2	9.9
Immigrant status (%)	36.1	61.9***	52.5	31.1***	59.4	68.6	43.7***
In neighborhood 1990/birth (%)	43.1	37.8	33.2	43.4*	39.1	32.7	35.4
<b>Family/maternal characteristics at Wave 1</b>							
Age at child's birth	26.00 (5.83)	26.05 (5.98)	25.48 (5.30)	25.45 (6.17)	25.48 (5.30)	25.71 (5.85)	24.80 (5.91)
Completed schooling	3.22 (1.28)	2.61*** (1.39)	2.61 (1.35)	2.72 (1.20)	2.93* (1.47)	2.33 (1.28)	2.66*** (1.28)
Married (%)	60.0	65.4*	56.6	55.7	57.8	54.7	43.6**
Employed (%)	65.8	56.9***	54.7	47.5	64.8	44.9	47.3
Depressed <sup>a</sup> (%)	17.3	16.8	23.8	19.6	25.8	25.3	15.0***
Welfare receipt (%)	22.1	23.8	31.3	36.5	30.5	40.8	47.6
Income-to-needs ratio	2.03 (1.37)	1.68*** (1.17)	1.32 (1.07)	1.27 (1.04)	1.73** (1.39)	1.03 (0.87)	1.20* (1.02)
<b>Youth outcomes (average across waves)</b>							
Self-report internalizing behavior	8.38 (6.59)	8.36 (6.25)	9.02 (6.91)	7.88* (5.64)	9.59 (6.64)	8.56 (6.70)	8.97 (6.49)
Maternal report internalizing behavior	12.11 (7.54)	12.16 (7.94)	12.62 (7.44)	12.79 (7.35)	13.05 (7.63)	12.83 (7.53)	12.65 (7.37)
Violent behavior	0.39 (0.72)	0.36 (0.66)	0.26 (0.61)	0.45** (0.74)	0.36 (0.82)	0.28 (0.57)	0.44** (0.80)
Property offenses	0.19 (0.43)	0.18 (0.38)	0.13 (0.35)	0.19** (0.41)	0.14 (0.42)	0.15 (0.35)	0.22* (0.48)
Sample size	1,228	399	265	219	128	245	839

Note. Table presents means with standard deviations in parentheses; test statistic computed via analysis of variance and percentages with test statistics computed via chi-square. Significance levels indicate significantly different from stable group for respective neighborhood poverty type.

<sup>a</sup> Assessed at Wave 2.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

with decreasing poverty and those in stable neighborhoods was 3.8 problems, which is over one half of a standard deviation ( $3.8/6.5 = .58$ ), or what is considered a large effect. The comparable difference between girls in neighborhoods that got less poor or were stable was very small (0.8).

For violent behavior, a main effect of decreasing poverty was found for intraindividual differences, but this association was moderated by child sex (see Table 5). As with internalizing problems, decreasing neighborhood poverty had a stronger association with boys' violent behavior compared with girls' behavior (see Figure 2). Boys in neighborhoods that got less poor increased in their violent behavior at a faster rate than boys in stable neighborhoods; the difference in predicted probabilities was 10%. The comparable difference for girls was considerably smaller (3%). Note that the positive values suggest that violent behavior is increasing for all youth even if the rate slows down over time. No significant main effects of decreasing poverty or interactions with child sex were found for self-reported internalizing problems or property offenses (results available from authors upon request).

### Moderate-Poverty Neighborhoods

**Descriptive findings.** Significant differences in background characteristics between youth and their families in moderately poor neighborhoods that were stable, increasing in poverty, and decreasing in poverty were seen (see Table 3). As compared with youth in stable neighborhoods, those in neighborhoods with in-

creasing poverty were more likely to be African American and less likely to be of other Latino or immigrant backgrounds. Although few other differences in background characteristics were evident, youth in neighborhoods that got poorer had fewer maternal-reported internalizing problems but more violent and property offenses than youth in stable neighborhoods. Consistent with social disorganization theory, neighborhoods with increasing poverty had significantly higher poverty and unemployment rates in 2000 but fewer mobile residents than stable neighborhoods (see Table 4).

In contrast to neighborhoods with increasing poverty, youth in neighborhoods with decreasing poverty were less likely to be African American and more likely to be of other Latino backgrounds than youth in stable neighborhoods. Youth in neighborhoods with decreasing poverty came from more advantaged families than youth in stable neighborhoods, but no significant differences in child outcomes emerged (see Table 3). As is seen in neighborhoods in the midst of gentrification, compared with stability, those with declining poverty had marginally fewer poor residents in 2000 and marginally more professional residents in 2000 (see Table 4).

**Multilevel findings.** According to the multilevel results, the main effects of neighborhood poverty change (increases and decreases) were not significantly associated with youth's maternal- or self-reported internalizing problems (results available upon request). A significant interaction between increasing poverty and child sex emerged for interindividual differences in self-reported

Table 4  
 1990 and 2000 U.S. Census Characteristics by Type of Neighborhood Poverty Change

Variable	Low poverty		Moderate poverty			High poverty	
	Stable <sup>a</sup>	Increase	Stable	Increase	Decrease	Stable	Decrease
Fraction poor							
1990	.11 (.05)	.08 (.08)	.23 (.03)	.23 (.03)	.25 (.03)	.35 (.04)	.44 <sup>†</sup> (.09)
2000	.11 (.05)	.20 <sup>**</sup> (.13)	.23 (.03)	.30 <sup>**</sup> (.03)	.19 <sup>†</sup> (.03)	.35 (.04)	.28 <sup>†</sup> (.09)
Fraction college educated							
1990	.20 (.18)	.16 (.16)	.18 (.14)	.07 (.05)	.28 (.18)	.07 (.08)	.09 (.08)
2000	.26 (.22)	.21 (.18)	.19 (.14)	.11 (.11)	.37 (.21)	.09 (.07)	.16 (.13)
Fraction unemployed men							
1990	.24 (.06)	.28 (.13)	.24 (.05)	.28 (.08)	.24 (.03)	.27 (.04)	.38 <sup>†</sup> (.13)
2000	.25 (.09)	.29 (.09)	.28 (.06)	.37 <sup>†</sup> (.09)	.23 (.07)	.34 (.05)	.35 (.13)
Fraction professionals/managers							
1990	.11 (.07)	.11 (.08)	.08 (.04)	.05 (.02)	.12 (.05)	.05 (.02)	.07 (.03)
2000	.13 (.08)	.13 (.08)	.09 (.04)	.07 (.01)	.14 <sup>†</sup> (.06)	.05 (.03)	.09 <sup>†</sup> (.04)
Fraction White							
1990	.59 (.36)	.77 (.25)	.42 (.15)	.29 (.22)	.40 (.24)	.26 (.06)	.23 (.20)
2000	.52 (.35)	.58 (.26)	.36 (.19)	.22 (.16)	.48 (.31)	.32 (.03)	.27 (.25)
Fraction Black							
1990	.29 (.40)	.04 <sup>†</sup> (.07)	.27 (.23)	.45 (.41)	.29 (.38)	.23 (.21)	.49 (.44)
2000	.32 (.41)	.07 <sup>†</sup> (.27)	.34 (.32)	.59 (.33)	.30 (.40)	.26 (.22)	.52 (.41)
Fraction Latino							
1990	.16 (.21)	.29 (.32)	.44 (.36)	.36 (.29)	.42 (.30)	.63 (.34)	.40 (.38)
2000	.24 (.25)	.50 <sup>*</sup> (.32)	.41 (.35)	.31 (.22)	.37 (.34)	.62 (.32)	.33 (.35)
Fraction foreign born							
1990	.17 (.16)	.21 (.19)	.26 (.10)	.22 (.16)	.26 (.17)	.38 (.17)	.20 (.21)
2000	.21 (.17)	.34 <sup>*</sup> (.18)	.29 (.13)	.18 (.11)	.22 (.12)	.38 (.16)	.18 <sup>*</sup> (.17)
Fraction housing built last 20 years							
1990	.11 (.13)	.10 (.19)	.07 (.03)	.07 (.05)	.18 (.21)	.14 (.09)	.17 (.13)
2000	.08 (.09)	.10 (.12)	.05 (.03)	.13 (.14)	.14 (.14)	.04 (.03)	.10 <sup>†</sup> (.07)
Fraction same house >5 years							
1990	.56 (.14)	.49 (.13)	.47 (.13)	.52 (.13)	.40 (.10)	.52 (.11)	.51 (.10)
2000	.57 (.14)	.52 (.10)	.48 (.11)	.62 <sup>*</sup> (.07)	.41 (.11)	.53 (.09)	.53 (.11)
Neighborhood sample size	31	9	7	4	5	5	18

Note. Table presents means with standard deviations in parentheses; test statistic computed via analysis of variance. Significance levels indicate significantly different from stable group for respective neighborhood poverty type.

<sup>a</sup> Includes three neighborhoods with decreasing poverty.

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

internalizing behavior only (see Table 6). Results indicated that increasing poverty had a pronounced association with boys' internalizing problems (see Figure 3). Boys in neighborhoods that got poorer had higher mean self-reported internalizing scores than boys in stable neighborhoods; the difference was approximately three problems (or just under one half of a standard deviation), which is also quite large. For girls, the comparable difference was only 0.6 problems (or approximately one tenth of a standard deviation), which is, again, very small.

Increasing poverty and its interactions with child sex were not significantly associated with youth's violent or property offenses, and decreasing poverty and its interaction with child sex were not significantly associated with any of the youth outcomes (see Table 6; complete results available upon request).

### Low-Poverty Neighborhoods

**Descriptive findings.** As with the other neighborhood poverty types, significant differences exist between youth in stable and increasingly poor, low-poverty neighborhoods. Youth in neighborhoods with increasing poverty were less likely to be African American or European American or of other race or ethnicity than

youth in stable neighborhoods but more likely to be Mexican American and of other Latino and immigrant backgrounds (see Table 3). Youth in neighborhoods that got poorer also came from more disadvantaged backgrounds than youth in stable neighborhoods, but no significant differences in child outcomes were found. Consistent with social disorganization theory pointing to the role of immigrants' in-migration as a critical source of neighborhood change, neighborhoods with increasing poverty had significantly more poor, Latino, and foreign-born residents than stable neighborhoods in 2000 (see Table 4).

**Multilevel findings.** Across the multilevel models, only one significant association for increasing poverty emerged for intraindividual differences in youth's violent behavior (complete results available from the authors upon request). A significant interaction with child sex revealed a pattern consistent with other interactions (see Table 6 and Figure 4). Boys in neighborhoods with rising poverty increased in their violent behavior at the fastest rate; however, the difference in the rate of change in violent behavior between boys in increasingly poor and stable neighborhoods was only 4%, which is notably smaller than differences observed in high- and moderate-poverty neighborhoods. For girls, the differ-

Table 5  
*Regression Coefficients With Standard Errors (in Parentheses) for Child, Maternal, Family, and Neighborhood Characteristics Associated With Youth Behavior in High-Poverty Neighborhoods*

Variable	Maternal-reported internalizing problems				Violent behavior			
	Model 1		Model 2		Model 1		Model 2	
	Interindividual	Intraindividual	Interindividual	Intraindividual	Interindividual	Intraindividual	Interindividual	Intraindividual
Intercept	7.00*** (1.47)	-0.38 (0.40)	8.73*** (1.26)	-0.33 (0.32)	-2.44*** (0.32)	0.14 (0.10)	-2.06*** (0.32)	0.14 (0.10)
Decreasing neighborhood poverty	0.96 (0.97)	0.12 (0.21)	0.84 (0.97)	0.11 (0.21)	0.02 (0.21)	0.13* (0.06)	0.01 (0.20)	0.10 (0.06)
Decreasing Poverty × Male			2.93** (0.90)	0.05 (0.33)			-0.24 (0.36)	0.28** (0.11)
Poverty 1990	4.39 (4.55)	1.14 (0.98)	3.63 (4.30)	1.08 (0.95)	1.99* (0.96)	0.00 (0.26)	1.95* (0.90)	-0.01 (0.26)
Child characteristics								
Mean age	0.28*** (0.08)	-0.01 (0.03)	0.26** (0.08)	0.00 (0.26)	0.21*** (0.02)	-0.05*** (0.01)	0.21*** (0.20)	-0.41*** (0.01)
Age squared					-0.01* (0.01)		-0.02 (0.01)	
Male	3.40* (1.44)	0.00 (0.44)	0.81 (1.54)	0.10 (0.49)	0.70*** (0.11)	-0.05 (0.03)	0.83* (0.32)	-0.07 (0.16)
Age × Male	-0.28* (0.11)	0.02 (0.04)	-0.26* (0.11)	0.01 (0.03)				-0.01 (0.01)
African American	-0.34 (0.85)	0.82*** (0.23)	-0.13 (0.84)	0.78*** (0.23)	0.35 (0.22)	-0.13 (0.07)	0.36 (0.22)	-0.13 (0.07)
Mexican American	1.13 (0.88)	0.66** (0.25)	1.25 (0.87)	0.65** (0.24)	-0.08 (0.24)	0.00 (0.08)	-0.4 (0.23)	-0.01 (0.08)
Other Latino	0.46 (1.00)	0.59* (0.28)	0.45 (0.98)	0.56* (0.28)	-0.03 (0.27)	-0.14 (0.09)	0.01 (0.27)	-0.14 (0.09)
Immigrant	0.71 (0.61)	-0.05 (0.17)	0.74 (0.60)	-0.06 (0.17)	-0.48** (0.17)	0.11* (0.06)	-0.51** (0.17)	0.12* (0.06)
Neighborhood 1990/birth	-0.26 (0.42)	-0.09 (0.12)	-0.27 (0.41)	-0.11 (0.12)	0.02 (0.12)	-0.07 (0.04)	0.05 (0.12)	-0.08* (0.04)
Maternal and family characteristics								
Age child birth	-0.02 (0.03)	0.01 (0.01)	-0.03 (0.03)	0.01 (0.01)	0.00 (0.01)	0.00 (0.00)	0.00 (0.01)	0.00 (0.00)
Education	-0.10 (0.19)	-0.01 (0.05)	-0.10 (0.19)	-0.01 (0.05)	0.01 (0.05)	0.03 (0.02)	0.01 (0.05)	0.03 (0.02)
Married	-1.97*** (0.46)	0.32* (0.14)	-2.05*** (0.46)	0.31* (0.14)	-0.39** (0.13)	0.01 (0.04)	-0.43** (0.13)	0.01 (0.04)
Change marriage	0.52 (0.48)	0.05 (0.14)	0.59 (0.47)	0.05 (0.14)	0.09 (0.13)	0.05 (0.04)	0.08 (0.13)	0.05 (0.04)
Employed	-0.93* (0.43)	-0.38** (0.12)	-0.93* (0.43)	-0.37** (0.12)	0.03 (0.13)	-0.04 (0.04)	0.01 (0.13)	-0.04 (0.04)
Change employment	0.72 (0.39)	0.05 (0.11)	0.74 (0.39)	0.07 (0.11)	0.13 (0.11)	-0.02 (0.04)	0.12 (0.11)	-0.02 (0.04)
Welfare	-0.10 (0.50)	0.17 (0.15)	-0.14 (0.49)	0.16 (0.15)	0.16 (0.14)	-0.02 (0.04)	0.13 (0.14)	-0.01 (0.04)
Change welfare	0.30 (0.43)	0.08 (0.13)	0.28 (0.43)	0.09 (0.13)	0.16 (0.12)	-0.01 (0.04)	0.17 (0.12)	-0.01 (0.04)
Income/needs	0.29 (0.26)	0.27*** (0.08)	0.26 (0.26)	0.28*** (0.08)	-0.09 (0.07)	0.00 (0.02)	-0.08 (0.07)	0.00 (0.02)
Change income	-0.61* (0.25)	-0.11 (0.07)	-0.66** (0.25)	-0.13 (0.07)	-0.01 (0.07)	-0.04 (0.02)	-0.01 (0.07)	-0.04 (0.02)
Depressed	2.99*** (0.50)	0.50*** (0.15)	2.89*** (0.50)	0.45*** (0.15)	0.43** (0.14)	0.06 (0.04)	0.44** (0.14)	0.06 (0.04)
Stay neighborhood at Wave 2	-0.44 (0.38)	-0.10 (0.11)	-0.47 (0.38)	-0.10 (0.11)	0.04 (0.11)	-0.02 (0.04)	0.05 (0.11)	-0.03 (0.04)

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

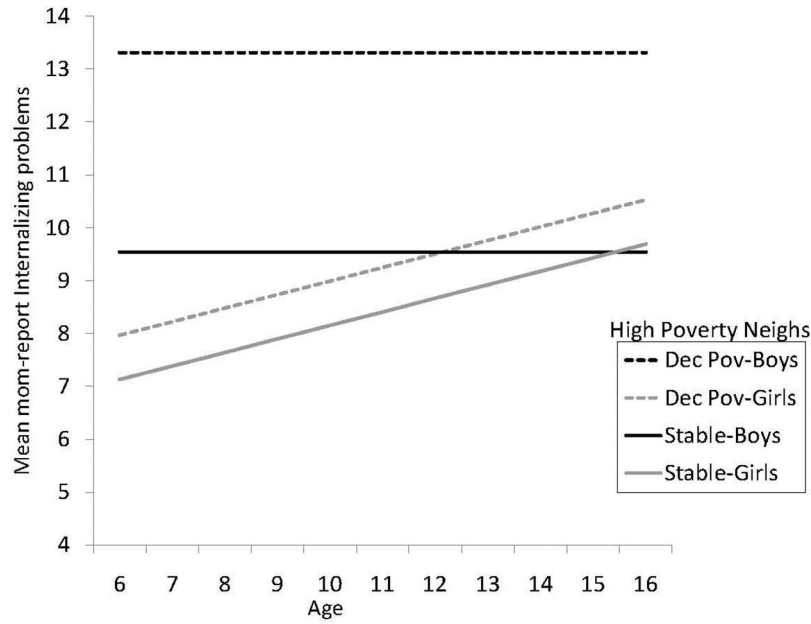


Figure 1. Interaction between decreasing (Dec) neighborhood poverty (Pov) and child sex for maternal-reported internalizing problems in high-poverty neighborhoods (Neighs).

ence in the rate of change in violent behavior between those in increasingly poor and stable neighborhoods was close to zero.

**Discussion**

This study is one of the first empirical investigations, to our knowledge, of the association between neighborhood poverty transformation and children’s and adolescents’ development. By

drawing on a unique sample of youth followed over 6 years in 80 Chicago neighborhoods of varying socioeconomic composition, we were able to examine associations among decreases and increases in neighborhood poverty and youth’s trajectories of internalizing and delinquent behaviors. In highlighting the role of within-neighborhood poverty changes on youth outcomes, this study provides a complement—or counterpoint—to the neighborhood mobility literature, which focuses on the impact of deca-

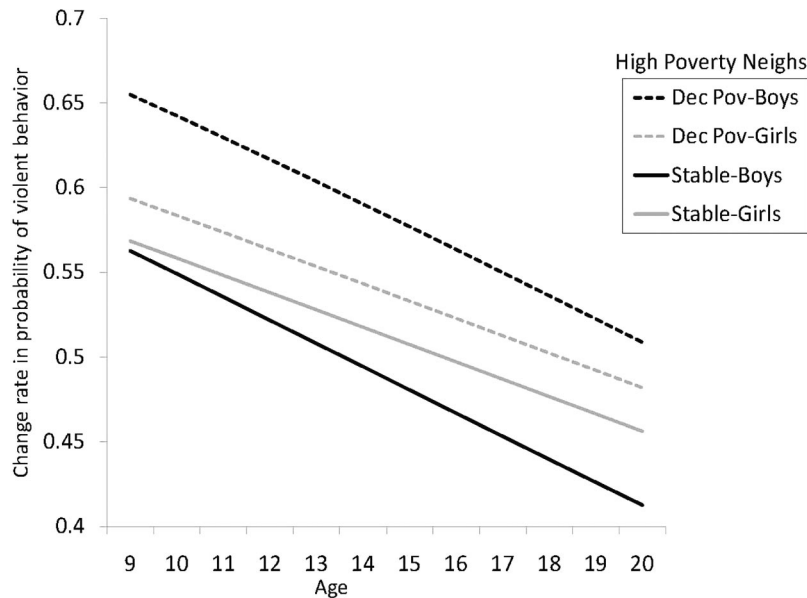


Figure 2. Interaction between decreasing (Dec) neighborhood poverty (Pov) and child sex for youth violent behavior in high-poverty neighborhoods (Neighs).

Table 6  
 Summary of Regression Coefficients With Standard Errors (in Parentheses) for Neighborhood Poverty Changes by Sex Interactions Associated With Youth Behavior in Moderate- and Low-Poverty Neighborhoods

Variable	Maternal-reported internalizing		Self-reported internalizing		Violent behavior		Property offenses	
	Intra-individual	Inter-individual	Intra-individual	Inter-individual	Intra-individual	Inter-individual	Intra-individual	Inter-individual
Moderate poverty								
Intercept	0.39 (0.34)	10.25*** (1.50)	-0.97 (0.63)	-3.04*** (0.41)	0.29 (0.15)	-4.55*** (0.63)	0.52 (0.28)	
Male	0.47 (0.51)	-0.18 (2.69)	0.09 (1.11)	0.93* (0.25)	-0.39 (0.23)	0.93* (0.33)	-0.11 (0.15)	
Decreasing neighborhood poverty	-0.22 (0.22)	1.40 (1.05)	0.03 (0.47)	0.44 (0.27)	-0.11 (0.11)	-0.51 (0.38)	-0.07 (0.16)	
Increasing neighborhood poverty	0.18 (0.17)	0.61 (0.83)	0.42 (0.39)	0.35 (0.22)	-0.11 (0.08)	0.15 (0.29)	0.01 (0.12)	
Male × Increasing Poverty	0.14 (0.35)	1.01 (1.42)	-0.28 (0.54)	0.13 (0.42)	0.15 (0.15)	-0.39 (0.57)	-0.06 (0.26)	
Male × Decreasing poverty	0.22 (0.31)	2.43* (1.26)	-0.27 (0.48)	-0.54 (0.37)	0.22 (0.13)	-0.38 (0.48)	0.18 (0.22)	
Low poverty								
Intercept	-0.02 (0.17)	11.34*** (0.83)	-0.61* (0.30)	-1.94*** (0.19)	0.14* (0.06)	-2.83*** (0.24)	0.38*** (0.09)	
Male	1.03** (0.34)	3.35 (1.75)	-0.89 (0.65)	0.88*** (0.10)	-0.05 (0.03)	-1.07* (0.45)	-0.07 (0.08)	
Increasing neighborhood poverty	0.17 (0.16)	0.49 (0.66)	-0.15 (0.23)	-0.02 (0.17)	-0.03 (0.05)	-0.18 (0.17)	-0.10 (0.07)	
Male × Increasing Poverty	-0.43 (0.37)	-1.79 (1.26)	0.80 (0.41)	-0.17 (0.21)	0.20** (0.07)	-0.22 (0.39)	0.15 (0.16)	

Note. All results presented are weighted and include all covariates (see Table 5).  
 \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

ing neighborhood poverty, brought about through residential relocation, on low-income children’s well-being (Fauth, Leventhal, & Brooks-Gunn, 2007; Keels, 2008; Kling et al., 2007).

**High-Poverty Neighborhoods**

Of particular interest for comparison with mobility programs were associations among decreases in poverty and youth’s problem behaviors in high-poverty neighborhoods. Our expectations that decreasing poverty would be most salient for youth’s problem behaviors and that associations were likely to be favorable, but to vary by gender, were partially met. Counter to expectations, however, decreasing poverty was associated with youth displaying more problem behaviors compared with youth in stable neighborhoods for two of the four outcomes in our multilevel analyses: maternal-reported internalizing problems and violent behavior. As anticipated, though, associations varied by gender, with boys more susceptible to decreases in poverty than girls.

Somewhat surprisingly, the pattern of findings is similar to that of MTO; however, the reasons underlying boys’ unfavorable outcomes in this study likely diverge from those of mobility programs (see Orr et al., 2003, for further discussion of MTO). As described earlier, decreasing poverty arising from gentrification may alter social processes, signaling a decline in social cohesion and ties initiated by the influx of new residents. This situation may be particularly challenging in the context of highly disadvantaged communities, where the collective capacity to monitor youth problem behavior may already be low. In line with this explanation, prior research on crime rates and gentrification points to adverse effects of modest changes in neighborhood disadvantage, as was the case in this study (Kreager et al., in press). It is also possible that some of the initial changes accompanying gentrification, such as greater amenities and new or refurbished housing, may not have direct benefits for youth, and may even engender resentment, which may lead to internalizing problems and violent behavior. Place-based interventions that directly target children, youth, and families, such as the HCZ, may yield results counter to the current study, which focused on naturally occurring decreases in poverty across a range of high-poverty neighborhoods.

**Moderate-Poverty Neighborhoods**

For moderate-poverty neighborhoods, results of multilevel analysis for self-reported internalizing problems only were in accordance with expectations that increasing poverty would be most salient for youth outcomes, that increasing poverty would be associated with youth’s greater problem behaviors compared with stable poverty, and that increasing poverty would be more strongly associated with boys’ behavior than girls’. Specifically, this pattern held for interindividual differences in self-reported internalizing problems, which parallels the findings of a broad nonexperimental literature linking neighborhood poverty to adverse mental health outcomes. Further, as seen in several recent policy demonstrations, such as MTO, and larger scale initiatives, such as HOPE VI, which entailed the demolition and redevelopment of distressed public housing, moderate-poverty neighborhoods are often targets for low-income families displaced or relocated from higher poverty neighborhoods (Orr et al., 2003; Popkin et al., 2002). The decline in social organization and institutional resources that ac-

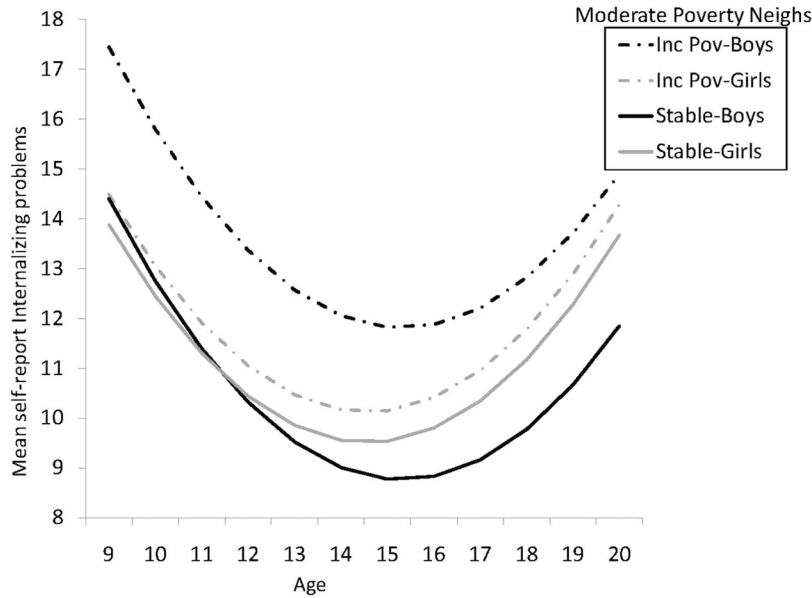


Figure 3. Interaction between increasing (Inc) neighborhood poverty (Pov) and child sex for self-reported internalizing problems in moderate-poverty neighborhoods (Neighs).

companies such changes may instill feelings of hopelessness in youth (Bolland, 2003). Despite these declining circumstances, youth may be protected to some extent by relatively high rates of social organization often seen in these more working-class neighborhoods and by the presence of some institutional supports for youth (Patillo-McCoy, 1999; Sullivan, 1989). These factors may explain the absence of associations among increasing poverty and youth's offending behavior.

**Low-Poverty Neighborhoods**

As with high-poverty neighborhoods, the sample distribution permitted exploration of only a limited set of hypotheses for low-poverty neighborhoods, those for increasing poverty. We did not anticipate that increasing poverty would be associated with youth's problem behaviors unless changes were quite large, which they were not. Counter to this expectation, multilevel analyses

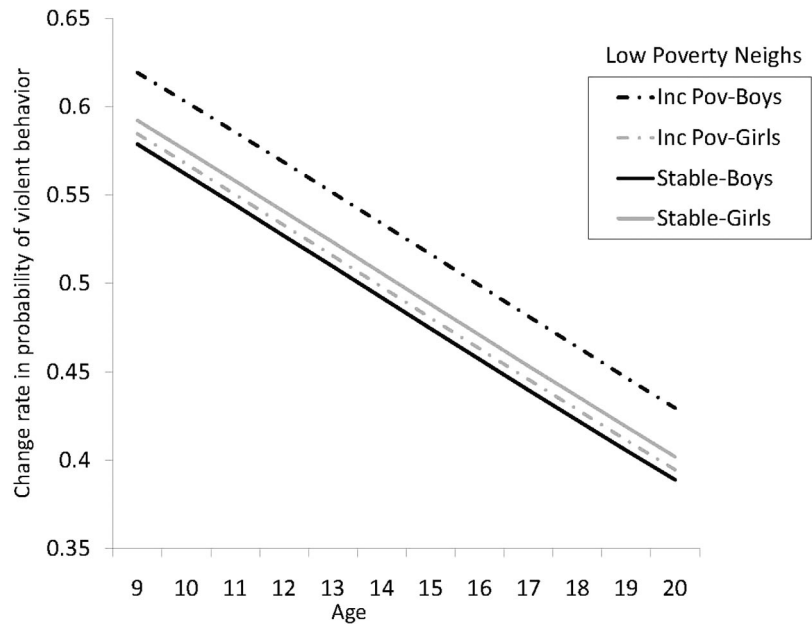


Figure 4. Interaction between increasing (Inc) neighborhood poverty (Pov) and child sex for youth violent behavior in low-poverty neighborhoods (Neighs).

revealed that rising poverty was associated with a greater probability that boys increased in their violent behavior (vs. stable poverty). These results are also in line with nonexperimental research pointing to unfavorable links between neighborhood poverty and adolescent delinquency. Boys' increasing violent behavior may have resulted from declining social organization, as described for moderate-poverty neighborhoods, and possibly their exposure to deviant peers.

It is important to acknowledge that, overall, youth outcomes in low-poverty neighborhoods were least associated with changes in poverty compared with high- and moderate-poverty neighborhoods. That is, effect sizes associated with poverty dynamics were large to moderate in high- and moderate-poverty neighborhoods and small in low-poverty neighborhoods. In lower poverty neighborhoods, greater social and institutional resources may protect youth to some extent from shifts in neighborhood poverty. In contrast, the absence of these resources (or smaller reserves) may make youth in poorer neighborhoods more vulnerable to changes in neighborhood poverty (increases or decreases) than their peers in low-poverty neighborhoods. One implication that flows from these findings is that youth in the lowest resource neighborhoods are likely to be affected most from community interventions aimed at reducing poverty. As the results from high-poverty neighborhoods indicate, however, poverty reduction initiatives may have unintended negative consequences if place-based efforts are not targeted directly at the needs of children and youth (e.g., HCZ).

### Gender Differences and Other Relevant Findings

More or less as expected, associations among poverty changes and youth's problem behaviors in multilevel models were stronger for boys than girls across neighborhood poverty types. This pattern is consistent with a broader literature on gender (Galambos et al., 2009) as well as extant neighborhood research on delinquency (Leventhal et al., 2009). Although few studies have considered how gender differences in the link between neighborhood SES and adolescents' outcomes emerge, as reviewed, several researchers have speculated that aspects of neighborhood safety, peer interactions, and family socialization may account for these differences. Our results suggest that decreases in poverty may not have been sufficient to alter safety in a meaningful and/or beneficial way for girls (Popkin et al., 2010). Rather, peer interactions occurring in neighborhoods, where dynamics were shifting, may explain boys' susceptibility to poverty changes (Clampet-Lundquist et al., 2006). Alternatively, if parents provide less supervision of boys' activities compared with girls', their greater exposure to neighborhoods may have contributed to differential sensitivity to poverty changes (Ensminger, Lambkin, & Jacobson, 1996; Entwisle, Alexander, & Olson, 1994; Kroneman, Loeber, & Hipwell, 2004).

An interesting pattern of findings emerged for intra- and inter-individual differences in youth outcomes. Poverty changes were associated with interindividual differences in boys' internalizing behavior but intraindividual differences in their violence. This pattern is somewhat unexpected but not uncommon, in that findings often do not correspond across intra- and interindividual differences within outcomes. Interpretation of such discrepancies is challenging, but it is worth noting that inter- and intraindividual differences address different type of outcomes as described earlier: average differences between individuals and change within indi-

viduals, respectively. Violence may be more sensitive to changes in poverty than internalizing behavior, because within-individual change is a more conservative test of contextual effects than between-individual differences. That is, interindividual differences are more likely than intraindividual differences to reflect underlying differences between youth in different types of neighborhoods (i.e., selection).

None of our hypotheses regarding adolescents' property offenses were met. This finding is somewhat unanticipated given the link in the literature between neighborhood poverty and associated conditions with property crime (see Sampson et al., 2002, for review) as well as studies of gentrification and crime (Kreager et al., in press) and results from MTO (Kling, Ludwig, & Katz, 2005) in which decreases in neighborhood poverty were more strongly linked to property than violent offenses. Moreover, the broader delinquency literature indicates that property crimes are tied more heavily to social factors and that violent crimes are linked more with biological and familial factors (Loeber & Hays, 1997). The lack of results may be due to the more limited number of items on the property crimes measure than the violence measure, which yielded restricted variability. In addition, we observed significant changes in individual violent behavior related to neighborhood poverty changes, whereas other studies focused on crime rates or differences in behavior between individuals only.

Another finding worth noting is that results for self- and maternal-reported internalizing problems did not converge. This finding is not surprising given their low bivariate correlation. This low correlation and the lack of corresponding results are common in the literature, particularly for internalizing problems (Kolko & Kazdin, 1993). The context in which youth and their mothers judge behavior likely varies, with youth's rating based on behavior across a variety of settings including home-family, neighborhood, school, and peers and mother's ratings based on behavior observed primarily in the home-family context. In addition, the outcomes varied in the subgroup sampled—9- to 20-year-olds for self-report problems and 6- to 16-year-olds for maternal-report problems—which could explain the discrepancies.

### Limitations

Despite the significance of this study for neighborhood and policy research, several limitations must be acknowledged. First, all studies of neighborhood effects, including change, are subject to problems of omitted variable bias as described earlier. Although this study cannot completely overcome this limitation, all analyses controlled for a host of potentially confounding factors; included propensity score weighting to adjust for potential selection out of Wave 1 neighborhoods; and examined intraindividual differences, which hold unmeasured characteristics constant. Of note is that issues of self-selected mobility arise in mobility experiments and are frequently not addressed. Second, we were able to test all our hypotheses, but the sample distribution inhibited a more complete understanding of poverty dynamics and their links to children's development. However, the distribution permitted an investigation of the patterns of change most commonly observed in the literature for each neighborhood poverty type, as reviewed in the introduction. A larger, national sample might have yielded greater variation, but it likely would have been at the expense of the neighborhood-based design and possibly rich longitudinal out-

comes. A third and related point is that our study is based on a single city during a specific period and results may not generalize to other locations or historical periods. Fourth, we lacked neighborhood data on individuals who moved out of their neighborhoods, and thus changes in poverty were not necessarily indicative of their circumstances. By using propensity score weighting, we attempted to adjust our analyses to be more reflective of associations among those youth who were residentially stable. Fifth, the timing of measurement for neighborhood poverty (1990–2000) and youth outcomes (from 1995–1996 to 2000–2001) was not completely aligned. As a result, isolating whether changes in poverty are driving results is challenging. A major weakness of census data is their availability only every 10 years. Until recently, with the release of the American Community Survey (ACS) by the U.S. Census Bureau in 2000, estimates of annual spatial poverty measures were not available aside from some local sources. An analysis of ACS data from available years (2006–2008) for 100 metropolitan areas revealed that annual changes in poverty were very small (e.g., mean change 2006–2007 =  $-.002$ ,  $SD = .02$ , and mean change 2007–2008 =  $.002$ ,  $SD = .02$ ), but accumulated changes over time were relatively larger (e.g., mean change 2000–2008 =  $.02$ ,  $SD = .02$ , based on decennial census and ACS data). In general, neighborhood poverty rates are quite persistent over time as demonstrated by others (e.g., Sampson & Morenoff, 2006). Thus, the lack of correspondence in timing of measurement should not be highly problematic or affect the overall interpretation of the results. Finally, we did not have data on changing neighborhood processes over time, such as collective efficacy and institutional resources, which would have permitted tests of the potential pathways of poverty dynamics. Nevertheless, we see this study as a first step in understanding links between neighborhood dynamics and youth outcomes.

## Conclusion and Implications

In sum, the contributions of this study are significant in that it is one of the first investigations to document associations among changes in neighborhood poverty and youth's internalizing problems and violent behavior. Results were relatively consistent across outcomes, inter- and intraindividual differences, and neighborhood poverty types. Changes in poverty were associated with boys' greater problem behavior compared with stable poverty. The reported associations were independent of changes in families' own socioeconomic circumstances and their propensity for mobility and were derived from a multilevel framework.

From a policy standpoint, these results indicate that successful efforts to reduce neighborhood poverty and ultimately promote children and adolescents' well-being may be hard won. This implication is similar to that of many mobility programs. Place-based reductions in neighborhood poverty may need to reach a certain threshold, such as 10%, 20%, or possibly higher, before benefits are seen (Galster et al., 2008; Kreager et al., in press). In addition, such efforts may need to directly target the needs of children, youth, and families, as is seldom done (Leventhal, Brooks-Gunn, & Kamerman, 1997).

## References

- Achenbach, T. M. (1990). *Young Adult Self Report*. Burlington: University of Vermont, Department of Psychiatry.

- Achenbach, T. M. (1991a). *Manual for the Child Behavior Checklist/4-18 and 1991 profile*. Burlington: Department of Psychiatry, University of Vermont.
- Achenbach, T. M. (1991b). *Manual for the Youth Self-Report and 1991 Profile*. Burlington: Department of Psychiatry, University of Vermont.
- Achenbach, T. M. (1997). *Young Adult Self Report*. Burlington: University of Vermont, Department of Psychiatry.
- Arulampalam, W. (2001). Is unemployment really scarring? Effects of unemployment experiences on wages. *Economic Journal*, *111*, F585–F606. doi:10.1111/1468-0297.00664
- Bolland, J. M. (2003). Hopelessness and risk behaviour among adolescents living in high-poverty inner-city neighbourhoods. *Journal of Adolescence*, *26*, 145–158. doi:10.1016/S0140-1971(02)00136-7
- Briggs, X. de S., Mueller, E., & Sullivan, M. L. (1997). *From neighborhood to community: Evidence on the social effects of community development*. New York, NY: Community Development Research Center, Graduate School of Management and Urban Policy, New School for Social Research.
- Browning, C. R., Leventhal, T., & Brooks-Gunn, J. (2005). Sexual initiation in early adolescence: The nexus of parental and community control. *American Sociological Review*, *70*, 758–778. doi:10.1177/000312240507000502
- Brueckner, J. K., & Rosenthal, S. S. (2009). Gentrification and neighborhood housing cycles: Will America's future downtowns be rich? *Review of Economics and Statistics*, *91*, 725–743. doi:10.1162/rest.91.4.725
- Burton, L. M., & Jarrett, R. L. (2000). In the mix, yet on the margins: The place of families in urban neighborhood and child development research. *Journal of Marriage and the Family*, *62*, 1114–1135. doi:10.1111/j.1741-3737.2000.01114.x
- Clampet-Lundquist, S., Edin, K., Kling, J. R., & Duncan, G. J. (2006). *Moving at-risk teenagers out of high-risk neighborhoods: Why girls fare better than boys*. Unpublished manuscript, Department of Economics, Princeton University, Princeton, NJ.
- Crosnoe, R. (2009). Low-income students and the socioeconomic composition of public high schools. *American Sociological Review*, *74*, 709–730. doi:10.1177/000312240907400502
- Dobbie, W., & Fryer, R. G., Jr. (2011). Are high-quality schools enough to increase achievement among the poor? Evidence from the Harlem Children's Zone. *American Economic Journal: Applied Economics*, *3*, 158–187. doi:10.1257/app.3.3.158
- Ellen, I. G., & O'Regan, K. (2008). Reversal of fortunes? Lower-income urban neighborhoods in the US in the 1990s. *Urban Studies*, *45*, 845–869. doi:10.1177/0042098007088471
- Ensminger, M. E., Lambkin, R. P., & Jacobson, N. (1996). School leaving: A longitudinal perspective including neighborhood effects. *Child Development*, *67*, 2400–2416. doi:10.2307/1131630
- Entwisle, D. R., Alexander, K. L., & Olson, L. S. (1994). The gender gap in math: Its possible origins in neighborhood effects. *American Sociological Review*, *59*, 822–838. doi:10.2307/2096370
- Fauth, R. C., Leventhal, T., & Brooks-Gunn, J. (2007). Welcome to the neighborhood? Long-term impacts of moving to low-poverty neighborhoods on poor children's and adolescents' outcomes. *Journal of Research on Adolescence*, *17*, 249–284. doi:10.1111/j.1532-7795.2007.00522.x
- Freeman, L. (2002). Gentrification and displacement. *Urban Prospect*, *8*(1), 1–4.
- Freeman, L. (2005). Displacement or succession? Residential mobility in gentrifying neighborhoods. *Urban Affairs Review*, *40*, 463–491. doi:10.1177/1078087404273341
- Freeman, L., & Braconi, F. (2004). Gentrification and displacement: New York City in the 1990s. *Journal of the American Planning Association*, *70*, 39–52. doi:10.1080/01944360408976337
- Galambos, N., Berenbaum, S. A., & McHale, S. M. (2009). Gender development in adolescents. In R. M. Lerner & L. Steinberg (Eds.),

- Handbook of adolescent psychology: Vol. 1. Individual bases of adolescent development* (3rd ed., pp. 305–357). Hoboken, NJ: Wiley.
- Galster, G. C., Cutsinger, J. M., & Malega, R. (2008). The costs of concentrated poverty: Neighborhood property markets and the dynamics of decline. In N. P. Retsinas & E. S. Belsky (Eds.), *Revisiting rental housing: Policies, programs, and priorities* (pp. 93–143). Washington, DC: Brookings Institution.
- Galster, G. C., Quercia, R. G., Cortes, A., & Malega, R. (2003). The fortunes of poor neighborhoods. *Urban Affairs Review*, *39*, 205–227. doi:10.1177/1078087403254493
- Goetz, E. G. (2003). *Clearing the way: Deconcentrating the poor in urban America*. Washington, DC: Urban Institute Press.
- Grasmuck, S. (2003). Something about baseball: Gentrification, “race sponsorship” and neighborhood boys’ baseball. *Sociology of Sport Journal*, *20*, 307–330.
- Hagan, J., Simpson, J., & Gillis, A. R. (1987). Class in the household: A power-control theory of gender and delinquency. *American Journal of Sociology*, *92*, 788–816. doi:10.1086/228583
- Harding, D. J. (2003). Counterfactual models of neighborhood effects: The effects of neighborhood poverty on dropping out and teenage pregnancy. *American Journal of Sociology*, *109*, 676–719. doi:10.1086/379217
- Heckman, J. (1979). Sample selection bias as a specification error. *Econometrica*, *47*, 153–161. doi:10.2307/1912352
- Hilbrecht, M., Zuzanek, J., & Mannell, R. C. (2008). Time use, time pressure and gendered behavior in early and late adolescence. *Sex Roles*, *58*, 342–357. doi:10.1007/s11199-007-9347-5
- Hirano, K., & Imbens, G. W. (2001). Estimation of causal effects using propensity score weighting: An application to data on right heart catheterization. *Health Services and Outcomes Research Methodology*, *2*, 259–278. doi:10.1023/A:1020371312283
- Huizinga, D., Esbensen, F.-A., & Weiher, A. W. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology*, *82*, 83–118. doi:10.2307/1143790
- Huston, A. C., & Ripke, M. N. (Eds.). (2006). *Developmental contexts in middle childhood: Bridges to adolescence and adulthood*. New York, NY: Cambridge University Press. doi:10.1017/CBO9780511499760
- Imbens, G. W. (2000). The role of the propensity score in estimating dose-response functions. *Biometrika*, *87*, 706–710. doi:10.1093/biomet/87.3.706
- Jackson, M. L., & Mare, R. D. (2007). Cross-sectional and longitudinal measurements of neighborhood experience and their effects on children. *Social Science Research*, *36*, 590–610. doi:10.1016/j.ssresearch.2007.02.002
- Jargowsky, P. A. (1997). *Poverty and place: Ghettos, barrios, and the American city*. New York, NY: Russell Sage Foundation.
- Jargowsky, P. A. (2003). *Stunning progress, hidden problems: The dramatic decline of concentrated poverty in the 1990s*. Washington, DC: Brookings Institution.
- Keels, M. (2008). Second-generation effects of Chicago’s Gautreaux Residential Mobility Program on children’s participation in crime. *Journal of Research on Adolescence*, *18*, 305–352. doi:10.1111/j.1532-7795.2008.00562.x
- Kennedy, M., & Leonard, P. (2001). *Dealing with neighborhood change: A primer on gentrification and policy choices*. Washington, DC: Brookings Institution and PolicyLink.
- Kessler, R. C., & Mroczek, D. (1994). *Scoring of the UM CIDI short forms*. Ann Arbor: Institute for Social Research, University of Michigan.
- Kingsley, G. T., & Pettit, K. L. S. (2003). *Concentrated poverty: A change in course*. Washington, DC: Urban Institute.
- Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econometrica*, *75*, 83–119. doi:10.1111/j.1468-0262.2007.00733.x
- Kling, J. R., Ludwig, J., & Katz, L. F. (2005). Neighborhood effects on crime for female and male youth: Evidence from a randomized housing voucher experiment. *Quarterly Journal of Economics*, *120*, 87–130. doi:10.1162/0033553053327470
- Kolko, D. J., & Kazdin, A. E. (1993). Emotional/behavioral problems in clinic and nonclinic children: Correspondence among child, parent and teacher reports. *Journal of Child Psychology and Psychiatry*, *34*, 991–1006. doi:10.1111/j.1469-7610.1993.tb01103.x
- Korbin, J. E., & Coulton, C. J. (1997). Understanding the neighborhood context for children and families: Combining epidemiological and ethnographic approaches. In J. Brooks-Gunn, G. J. Duncan, & J. L. Aber (Eds.), *Neighborhood poverty: Vol. 2. Policy implications in studying neighborhoods* (pp. 65–79). New York, NY: Russell Sage Foundation.
- Kreager, D. A., Lyons, C. J., & Hays, Z. (in press). *Urban revitalization and Seattle crime, 1982–2000. Social Problems*.
- Kroneman, L., Loeber, R., & Hipwell, A. E. (2004). Is neighborhood context differently related to externalizing problems and delinquency for girls compared with boys? *Clinical Child and Family Psychology Review*, *7*, 109–122. doi:10.1023/B:CCFP.0000030288.01347.a2
- Kubisch, A. C., Auspos, P., Brown, P., Chaskin, R., Fulbright-Anderson, K., & Hamilton, R. (2002). *Voices from the field II: Reflections on comprehensive community change*. Washington, DC: Aspen Institute.
- Leventhal, T., & Brooks-Gunn, J. (2001). Changing neighborhoods and child well-being: Understanding how children may be affected in the coming century. *Advances in Life Course Research*, *6*, 263–301. doi:10.1016/S1040-2608(01)80013-7
- Leventhal, T., & Brooks-Gunn, J. (2003). Neighborhood-based initiatives. In J. Brooks-Gunn, A. S. Fuligni, & L. J. Berlin (Eds.), *Early child development in the 21st century: Profiles of current research initiatives* (pp. 279–295). New York, NY: Teachers College Press.
- Leventhal, T., Brooks-Gunn, J., & Kamerman, S. (1997). Communities as place, face, and space: Provision of services to young children and their families. In J. Brooks-Gunn, G. J. Duncan, & J. L. Aber (Eds.), *Neighborhood poverty: Vol. 2. Policy implications in studying neighborhoods* (pp. 182–205). New York, NY: Russell Sage Foundation.
- Leventhal, T., Dupéré, V., & Brooks-Gunn, J. (2009). Neighborhood influences on adolescent development. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology: Vol. 2. Contextual influences on adolescent development* (3rd ed., pp. 411–443). Hoboken, NJ: Wiley. doi:10.1002/9780470479193.adlpsy002013
- Loeber, R., & Hays, D. F. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology*, *48*, 371–410. doi:10.1146/annurev-psych.48.1.371
- Martin, K. R., & Schoua-Glusberg, A. (2002). *Project on Human Development in Chicago Neighborhoods Longitudinal Cohort Study: Field data collection report*. Cambridge, MA: Harvard University.
- Massey, D. S. (1996). The age of extremes: Concentrated affluence and poverty in the twenty-first century. *Demography*, *33*, 395–412. doi:10.2307/2061773
- McKinnish, T., Walsh, R., & White, T. K. (2010). Who gentrifies low-income neighborhoods? *Journal of Urban Economics*, *67*, 180–193. doi:10.1016/j.jue.2009.08.003
- O’Hare, W., & Mather, M. (2003). *The growing number of kids in severely distressed neighborhoods: Evidence from the 2000 census*. Baltimore, MD: Annie E. Casey Foundation and Population Reference Bureau.
- Orr, L., Feins, J. D., Jacob, R., Beecroft, E., Sanbonmatsu, L., Katz, L. F., . . . Kling, J. R. (2003). *Moving to Opportunity interim impacts evaluation*. Washington, DC: U.S. Department of Housing and Urban Development.
- Patillo-McCoy, M. (1999). *Black picket fences: Privilege and peril among the middle class*. Chicago, IL: University of Chicago Press.
- Peters, D. J. (2009). Typology of American poverty. *International Regional Science Review*, *32*, 19–39. doi:10.1177/0160017608325795
- Popkin, S. J., Leventhal, T., & Weismann, G. (2010). Girls in the ‘hood:

- Reframing safety and its impact on health and behavior. *Urban Affairs Review*, 45, 715–744. doi:10.1177/1078087410361572
- Popkin, S. J., Levy, D. K., Harris, L. E., Comey, J., Cunningham, M. K., & Buron, L. (with Woodley, W.). (2002). *HOPE VI Panel Study: Baseline report*. Washington, DC: Urban Institute.
- Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Raudenbush, S. W., Bryk, A. S., Cheong, Y. F., Congdon, R., & du Toit, M. (2004). *HLM 6: Hierarchical linear and nonlinear modeling*. Lincolnwood, IL: Scientific Software International.
- Raudenbush, S. W., Johnson, C., & Sampson, R. J. (2003). A multivariate, multilevel Rasch model with application to self-reported criminal behavior. *Sociological Methodology*, 33, 169–211. doi:10.1111/j.0081-1750.2003.t01-1-00130.x
- Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70, 41–55. doi:10.1093/biomet/70.1.41
- Salama, J. J. (1999). The redevelopment of distressed public housing: Early results from HOPE VI projects in Atlanta, Chicago, and San Antonio. *Housing Policy Debate*, 10, 95–142.
- Sampson, R. J. (1997). Collective regulation of adolescent misbehavior: Validation results from eighty Chicago neighborhoods. *Journal of Adolescent Research*, 12, 227–244. doi:10.1177/0743554897122005
- Sampson, R. J. (2001). How do communities undergird or undermine human development? Relevant contexts and social mechanisms. In A. Booth & N. Crouter (Eds.), *Does it take a village? Community effects on children, adolescents, and families* (pp. 3–30). Mahwah, NJ: Erlbaum.
- Sampson, R. J., & Morenoff, J. D. (2006). Durable inequality: Spatial dynamics, social processes, and the persistence of poverty in Chicago neighborhoods. In S. Bowles, S. N. Durlauf, & K. Hoff (Eds.), *Poverty traps* (pp. 176–203). Princeton, NJ: Princeton University Press.
- Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing “neighborhood effects”: Social processes and new directions in research. *Annual Review of Sociology*, 28, 443–478. doi:10.1146/annurev-soc.28.110601.141114
- SAS Institute. (2003). *SAS user's guide: Version 9*. Cary, NC: SAS Institute.
- Schwirian, K. P. (1983). Models of neighborhood change. *Annual Review of Sociology*, 9, 83–102. doi:10.1146/annurev.so.09.080183.000503
- Shanahan, L., McHale, S. M., Crouter, A. C., & Osgood, D. W. (2007). Warmth with mothers and fathers from middle childhood to late adolescence: Within- and between-families comparisons. *Developmental Psychology*, 43, 551–563. doi:10.1037/0012-1649.43.3.551
- Sharkey, P. (in press). An alternative approach to addressing selection into and out of social settings: Neighborhood change and African American children's economic outcomes. *Sociological Methods & Research*.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago, IL: University of Chicago Press.
- Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From neurons to neighborhoods: The science of early child development*. Washington, DC: National Academy of Sciences.
- South, S. J., & Crowder, K. D. (1997). Residential mobility between cities and suburbs: Race, suburbanization, and back-to-the-city moves. *Demography*, 34, 525–538. doi:10.2307/3038307
- South, S. J., & Crowder, K. D. (1998). Leaving the 'hood: Residential mobility between Black, White, and integrated neighborhoods. *American Sociological Review*, 63, 17–26. doi:10.2307/2657474
- Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, 52, 83–110. doi:10.1146/annurev.psych.52.1.83
- Sullivan, M. L. (1989). *“Getting paid”*: Youth crime and work in the inner city. Ithaca, NY: Cornell University Press.
- U.S. Census Bureau. (1995). *Statistical brief: Poverty areas*. Retrieved from [http://www.census.gov/apsd/www/statbrief/sb95\\_13.pdf](http://www.census.gov/apsd/www/statbrief/sb95_13.pdf)
- U.S. Census Bureau. (2009). *Residential mover rate in U.S. is lowest since Census Bureau began tracking in 1948*. Retrieved from [http://www.census.gov/newsroom/releases/archives/mobility\\_of\\_the\\_population/cb09-62.html](http://www.census.gov/newsroom/releases/archives/mobility_of_the_population/cb09-62.html)
- Vigdor, J. L. (2002). Does gentrification harm the poor? *Brookings-Wharton Papers on Urban Affairs*, 133–182. doi:10.1353/urb.2002.0012
- Wilson, W. J. (1987). *The truly disadvantaged: The inner city, the underclass, and public policy*. Chicago, IL: University of Chicago Press.
- Wilson, W. J. (1996). *When work disappears: The world of the new urban poor*. New York, NY: Knopf.
- Xue, Y., Leventhal, T., Brooks-Gunn, J., & Earls, F. J. (2005). Neighborhood residence and mental health problems of 5- to 11-year olds. *Archives of General Psychiatry*, 62, 554–563. doi:10.1001/archpsyc.62.5.554

(Appendix follows)

**Appendix**  
**Summary of Unweighted Regression Coefficients With Standard Errors (in Parentheses) for Neighborhood Poverty Change by Sex Interactions Associated With Youth Behavior by Neighborhood Poverty Group**

Variable	Maternal-reported internalizing		Self-reported internalizing		Violent behavior		Property offenses	
	Interindividual	Intraindividual	Interindividual	Intraindividual	Interindividual	Intraindividual	Interindividual	Intraindividual
<b>High poverty</b>								
Intercept	7.34*** (1.25)	-0.03 (0.32)	12.57*** (1.35)	-0.82 (0.51)	-1.90*** (0.31)	0.09 (0.10)	-3.13*** (0.38)	0.23 (0.17)
Male	1.71 (1.59)	0.33 (0.46)	4.05 (2.30)	-2.14** (0.81)	0.70* (0.27)	-0.02 (0.16)	0.38 (0.29)	-0.05 (0.12)
Decreasing neighborhood poverty	1.13 (0.90)	0.05 (0.20)	0.08 (0.77)	0.03 (0.30)	0.03 (0.18)	0.16* (0.06)	0.24 (0.21)	0.00 (0.11)
Male × Decreasing poverty	1.85 (0.93)	0.08 (0.28)	0.33 (1.42)	0.45 (0.37)	0.00 (0.30)	0.13 (0.10)	0.17 (0.32)	0.10 (0.14)
<b>Moderate poverty</b>								
Intercept	7.56*** (1.26)	0.24 (0.36)	11.08*** (1.53)	-1.00 (0.61)	-2.71*** (0.40)	0.22 (0.15)	-4.30*** (0.60)	0.44 (0.27)
Male	-2.16 (1.88)	0.14 (0.56)	0.39 (2.82)	-0.32 (1.13)	0.75** (0.24)	-0.40 (0.24)	0.64 (0.32)	0.00 (0.14)
Decreasing neighborhood poverty	-0.03 (0.88)	-0.20 (0.25)	0.72 (0.97)	0.09 (0.37)	0.37 (0.26)	-0.18 (0.19)	-0.40 (0.36)	-0.14 (0.17)
Increasing neighborhood poverty	-0.84 (0.66)	0.24 (0.19)	0.49 (0.70)	0.43 (0.27)	0.35 (0.20)	-0.05 (0.08)	0.35 (0.26)	-0.07 (0.12)
Male × Increasing Poverty	0.58 (1.34)	-0.07 (0.38)	2.05 (1.52)	0.05 (0.57)	0.29 (0.43)	0.25 (0.16)	0.24 (0.59)	-0.03 (0.27)
Male × Decreasing poverty	1.65 (1.12)	0.12 (0.32)	1.38 (1.28)	-0.09 (0.48)	-0.26 (0.35)	0.23 (0.13)	-0.04 (0.46)	0.08 (0.21)
<b>Low poverty</b>								
Intercept	9.23*** (0.70)	0.36* (0.18)	10.44*** (0.86)	-0.46 (0.32)	-1.89*** (0.20)	0.06 (0.07)	-2.77*** (0.25)	0.30** (0.10)
Male	1.27 (1.10)	0.39 (0.32)	2.84 (1.58)	-0.96 (0.60)	0.90*** (0.10)	-0.02 (0.04)	-0.63 (0.43)	-0.03 (0.06)
Increasing neighborhood poverty	-0.42 (0.61)	0.19 (0.15)	0.18 (0.52)	-0.19 (0.20)	0.07 (0.15)	0.01 (0.05)	-0.05 (0.17)	-0.02 (0.06)
Male × Increasing Poverty	0.19 (0.73)	-0.28 (0.28)	-1.73 (0.96)	0.56 (0.34)	-0.46* (0.21)	0.12 (0.07)	-0.37 (0.32)	0.16 (0.13)

*Note.* All results presented are adjusted for the following covariates: child's age, gender, race/ethnicity, immigrant status, and whether lived in Wave 1 neighborhood since 1990/birth; mother's age at child's birth, education, marital status, change in marital status, employment status, and change in employment status; family's welfare receipt, change in welfare receipt, income to needs, and change in income to needs; maternal depression; and whether family stayed in neighborhood through Wave 2.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

Received January 8, 2010  
 Revision received May 20, 2011  
 Accepted June 8, 2011 ■