RACIAL AND ETHNIC INEQUALITIES IN TRAJECTORIES OF

NEIGHBORHOOD POVERTY AND NEIGHBORHOOD COLLEGE-EDUCATED

FROM ADOLESCENCE TO EARLY ADULTHOOD

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Abstract

Using data from four waves of the National Longitudinal Study of Adolescent to Adult
Health, this paper examines trajectories of neighborhood poverty and college-educated
neighbors from adolescence, through the transition to adulthood, and into young
adulthood. It assesses hypotheses derived from place stratification and life course theories
regarding the stability of inequalities and differential benefits of educational attainment
and residential mobility across racial and ethnic subgroups. Inequalities in neighborhood
poverty are greatest in adolescence but decrease over time, though blacks and Hispanics
remain disadvantaged relative to whites and Asians. Inequalities in neighborhood
college-educated are somewhat smaller in adolescence but increase over time, with
Asians and whites the most advantaged. Completion of a four-year degree is associated
with decreases in neighborhood poverty for all groups, with black and foreign-born
Hispanics reaping the greatest benefits. College completion is also associated with
increases in neighborhood-level college attainment for all groups, with Asians and whites
experiencing the greatest gains. With respect to moves, black and foreign-born Hispanics
see the greatest decreases in neighborhood poverty, whereas all groups benefit through
increases in the percentage of neighbors who are college-educated.

Keywords: Neighborhoods, Poverty, Education, Race, Ethnicity

Introduction

       Studies of locational attainment in the United States document durable inequalities in neighborhood disadvantage across racial and ethnic groups (Sampson 2009; Sharkey 2013). Blacks, in particular, are more likely to live in poor neighborhoods, and are less likely to gain access to affluent neighborhoods than their white counterparts (Logan et al. 1996; South and Crowder 1997). Hispanics are also disadvantaged relative to whites, but to a lesser degree than blacks. Studies of intergenerational neighborhood mobility present a similarly dire situation in which neighborhood disadvantage experienced during childhood is largely reproduced in adulthood, particularly for black youth (Sharkey 2008).

       Recent research using a life course perspective and tracking neighborhood attainments from adolescence into young adulthood, however, suggests some room for optimism with regard to the possibility of turning points in adulthood that may improve the neighborhood attainments of some minority youth. For example, one recent study observed that black and Hispanic youth who were able to pursue higher education made locational attainment gains in the early transition to adulthood (Swisher, Kuhl, and Chavez 2013). Other research suggests that black families making longer distance moves, particularly away from metropolitan areas with higher levels of segregation and racial inequality, make some gains in locational attainment, though these gains may be temporary as the neighborhoods into which they move deteriorate over time (Sharkey 2012). Sampson and Sharkey (2008) also find moves outside of Chicago to be associated with intragenerational improvements in neighborhood attainments, reductions in adolescent violent offending, and exposure to violence (Sharkey and Sampson 2010).

Additional research is needed, however, using nationally representative data and following respondents further into adulthood, to more fully assess the benefits of higher education and residential mobility for minority youth growing up in disadvantaged neighborhoods. In the present study we examine these issues using data from all four waves of the National Longitudinal Study of Adolescent to Adult Health. We use hierarchical growth curve models to estimate trajectories of locational attainments (i.e., neighborhood poverty, neighborhood college completion) from adolescence, through the transition to adulthood, and into early adulthood. The study examines the degree of inequality between white, black, Asian, and Hispanic subgroups (as well as native and foreign-born statuses among Hispanics). We assess the degree to which long distance moves and completion of post-secondary education translate into locational gains between adolescence and young adulthood, and whether these gains vary by racial and ethnic subgroups. The longitudinal data allow consideration of both short-term (i.e., only in the transition to adulthood) and long-term (i.e., into early adulthood) locational gains from residential mobility and educational attainment.

Literature Review

Place Stratification: Strong and Weak Versions

The dominant contemporary approach to understanding locational inequalities is place stratification theory (Logan and Molotch 1987; Logan and Alba 1993), which problematizes the traditional "spatial assimilation" theory hypothesis that as immigrant groups make socioeconomic gains, they will be able to convert these resources into corresponding geographic or spatial gains, such as access to advantaged neighborhoods and greater residential integration with native populations (Alba et al. 1999; Crowder and

South 2005; Logan and Alba 1993; Massey 1985; South, Crowder and Chavez 2005; South, Crowder and Pais 2008). Place stratification theory posits that racial and ethnic subgroups do not have the same ability, relative to whites, to convert socioeconomic resources into locational gains due to continuing racial and ethnic discrimination and segregation (Massey and Denton 1993; Yinger 1995). The theory is most often used to explain the poorer neighborhood environments of blacks, but segmented assimilation theory suggests that some immigrant subgroups face similar disadvantages (Portes and Zhou 1993).

Two versions of place stratification theory make different empirical predictions about the relationship between socioeconomic resources and locational gains. The "strong" version (Logan and Alba 1993; South and Crowder 1998) predicts that, due to discrimination and continuing segregation, blacks and other historically disadvantaged groups will be unable to convert socioeconomic resources into better neighborhood environments; thus one would predict a weaker association between socioeconomic resources and neighborhood attainments for blacks than whites. The "weak" version, in contrast, contends that whites are so advantaged in society that very few of them will ever live in the most disadvantaged neighborhoods. Thus they don't require much in the way of socioeconomic resources to avoid the worst neighborhoods (Adelman et al. 2001; South, Crowder and Chavez 2005). Blacks, in contrast, require high levels of socioeconomic resources in order to escape the disadvantaged environments of their lower socioeconomic black counterparts. Thus, the weak version predicts a stronger association between socioeconomic resources and locational attainment among blacks compared to whites. Though they make different empirical predictions about the

conditional relationship between socioeconomic resources and locational attainment, it is important to emphasize that both versions of place stratification theory predict that minority groups will remain disadvantaged relative to whites. Even with improvement in socioeconomic resources, the weak version predicts that most blacks or other disadvantaged ethnic minorities would still not reach the neighborhood attainments of lower socioeconomic status whites. Earlier applications of place stratification tended to find support for the strong version of the theory (e.g., Logan and Alba 1993; Crowder 2001), whereas more recent studies have largely found evidence in favor of the weak version (Adelman et al. 2001; Crowder and South 2005; South, Crowder and Chavez 2005; Swisher, Kuhl and Chavez 2013; Woldoff and Ovadia 2009). Pais, South, and Crowder (2012) find evidence of both versions depending on characteristics of the metropolitan areas in which neighborhoods are located.

Stability and Change in Locational Attainments Across the Life Course

Researchers applying a life course perspective, and examining the duration, timing, and intergenerational transmission of neighborhood experiences, also report considerable stability in locational inequalities (Quillian 2003; Sampson and Morenoff 2006; Sampson and Sharkey 2008; Sharkey 2008; Swisher, Kuhl, and Chavez 2013; Timberlake 2007a; Timberlake 2007b). Timberlake (2007a) estimates that black children spend about 50 percent of their childhoods in poor neighborhoods, compared to 40 percent of a Latino's childhood, and only 5 percent of a white's childhood. With respect to inter-generational transmission, Sharkey (2008) found that 72 percent of black youth who grew up in the bottom quartile of the neighborhood income distribution remained there in adulthood, compared to only 40 percent of white youth. This pattern is even more

pronounced at the extremes, where he found that 55 percent of black youth in the poorest 10% of neighborhoods remained in the bottom 10% in adulthood, compared to 19 percent of whites (Sharkey 2008).

Life course researchers also seek to identify sources of change, or turning points, associated with upward and downward neighborhood mobility. A set of recent studies have reported locational gains for black and other minority groups, particularly for those pursuing higher education, or who make longer distance moves. Though not testing for racial and ethnic differences, Sharkey (2008) observed that pursuit of higher education was positively associated with upward, and negatively associated with downward, intergenerational neighborhood mobility between childhood and adulthood (age 26 or older) in the PSID. Swisher, Kuhl, and Chavez (2013), using data from Add Health, found that pursuit of post-secondary education was associated with intergenerational reductions in neighborhood poverty. Moreover, they found that this association was particularly strong among blacks and Hispanics. A potential limitation, however, is that neighborhood attainments were assessed during the transition to adulthood (ages 18-25), a period during which attainments are still developing and in flux.

One possible reason why going to college is so beneficial for those from disadvantage neighborhoods is because it is relatively uncommon. Research by Harding (2003), for example, showed that living in a poor neighborhood during adolescence was associated with a doubling of the risk of dropping out of high school. On the other hand, Sharkey (2013) found that blacks actually pursue more education than whites, controlling for family background and other factors including prior neighborhood poverty.

With respect to the role of moves, Timberlake (2007b) examined racial inequalities in changes in children's neighborhood socioeconomic status for two groups, those remaining in the same home and those who were residentially mobile. He found that non-mobile white children experienced greater neighborhood improvements over time than did black or Latino children. However, less inequality was observed among residentially mobile youth, and in some cases, minority children gained more from mobility than did their white counterparts (Timberlake 2007b). The benefits of residential mobility have also been shown by Sharkey and colleagues in a series of papers. Using the PSID Sharkey (2008) found that living in the same county in adulthood (i.e., as during childhood) was negatively associated with upward intergenerational neighborhood mobility. Using data from the Project on Human Development in Chicago Neighborhoods, Sampson and Sharkey (2008) found that households that moved outside of Chicago (including whites, blacks, and Latinos) experienced larger increases in neighborhood median income than did those who remained in the same neighborhood or who made residential moves within Chicago. Extending the analysis to intergenerational neighborhood mobility, Sharkey (2012) found that black and Latino young adults who left Chicago experienced reductions in neighborhood poverty, compared to blacks and Latinos who left their parents' homes but remained in Chicago. In contrast, white young adults who moved away from Chicago experienced increases in neighborhood poverty.

Sharkey's (2012) research, however, raises an important possible caveat, which is that these gains experienced by black and Latino respondents may be short-lived. In replicating the findings of the PHDCN within the PSID, he found that black respondents making longer distance moves experienced short-term gains in locational attainment in

the early transition to adulthood, but that these gains disappeared over time as the destination neighborhoods to which blacks were moving deteriorated over time.

The temporary nature of changes in neighborhood poverty in the transition to adulthood may also reflect its transitory nature. Take youth going to college during their early 20s. If these youth come from advantaged backgrounds, they may experience an increase in neighborhood poverty associated with living in neighborhoods surrounding universities. Sharkey points to this as an explanation for the short-term increases in neighborhood poverty experienced by white youth who moved away from Chicago to go college (Sharkey 2012). Youth from disadvantaged backgrounds who go to college, in contrast, might experience a decrease in neighborhood poverty relative to the neighborhoods of concentrated poverty from which they started. Then as individuals from advantaged backgrounds move further through the transition into adulthood, start career-related jobs, and form families, one would expect neighborhood poverty rates to decrease again, though perhaps not fully reaching the neighborhood advantage that their parents had achieved in later adulthood (i.e., when the respondents were in adolescence). What happens to youth from disadvantaged backgrounds in later adulthood is somewhat harder to predict, though Sharkey's research suggests that they may expect to experience increases in neighborhood poverty over time. Research based on the quasi-experimental Moving to Opportunity Demonstration Program also suggests potential difficulties for disadvantaged families integrating into more advantaged neighborhoods (particularly those with boys), which might lead to subsequent losses of initital improvements (e.g., Clampet-Lundquist, Edin, Kling, and Duncan 2011).

The Current Study

This study contributes to the literature in several ways. First, by using data from all four waves of Add Health, it examines patterns of change in intergenerational neighborhood attainments for whites, blacks, Hispanics, and Asians, from their neighborhoods during adolescence, through the transition to adulthood (ages 18 to 25), and into adulthood (ages 26 to 32). The analysis assesses the degree to which racial and ethnic groups receive different returns to residential mobility and the pursuit of post-secondary education, and whether these differences are short-lived (i.e., only during the transition to adulthood) or more lasting (i.e., further into adulthood).

It also contributes by considering two measures of neighborhood attainment: the percent of residents below poverty, and the percent of residents with a college-degree or more. Neighborhood poverty is a commonly used measure that requires less justification. Yet it is important to also consider the presence of college-educated neighbors for several reasons. First is that going to college is one of the focal predictors of neighborhood attainment. A focus on college-educated neighborhoods is also consistent with research suggesting that the presence of high-SES neighbors may matter more for positive youth outcomes than does the presence of low-SES neighbors (e.g., see review by Leventhal and Brooks-Gunn 2000). Additionally, examining both neighborhood poverty and neighborhood college-educated may help to disentangle the unusual neighborhood environments of those in college, who may be relatively poor in the short-term, but also relatively well educated. Lastly, research suggests that residential segregation on the basis of education is rapidly growing (Domina 2006; Massey, Rothwell, and Domina 2009).

Based on the previous literature and the life course perspective, we make several general hypotheses about expected patterns of locational attainment between adolescence and early adulthood. First, we expect to observe considerable stability of inequalities in neighborhood poverty and college-educated residents over time for all racial and ethnic groups. Consistent with the spatial assimilation model, we expect that some of these inequalities (particularly for Hispanic groups) will be explained by differences in family SES and family structure in adolescence. With respect to post-secondary degree completion, we expect blacks and Hispanic subgroups to experience larger decreases in neighborhood poverty, and larger increases in college-educated neighbors, than will white or Asian respondents. Though consistent with place stratification model, blacks and Hispanic will remain disadvantaged overall relative to whites and Asians in early adulthood (i.e., they will have lower neighborhood attainments after accounting for the benefits of post-secondary educational completions). Finally, we expect long distance moves to be associated with greater improvements in neighborhood attainments for blacks and Hispanics relative to their white and Asian counterparts.

Methods

Sample

Data are from Waves I through IV of the National Longitudinal Study of Adolescent to Adult Health, a nationally representative sample of 7th to 12th graders in the United States in 1995 (Bearman, Jones and Udry 1997). The sampling frame included 80 high schools and their feeder middle schools. At Wave I, 20,745 adolescents were randomly selected from school rosters to complete in-home interviews, and be part of the

longitudinal national sample. One year later, 88.2 percent of the in-home sample completed Wave II interviews. Those graduating between waves were not interviewed at Wave II, but were contacted for follow-ups at Waves III and IV. At Wave III (2001-2002), 73.3% of the original respondents were re-interviewed. At Wave IV, conducted in 2008-9, 92.5% of original respondents were located (living in all 50 states), and 80.3% of eligible respondents participated.

The analysis is limited to those participating at Waves I and IV, who have valid sample weights, and who are non-missing on key study variables. An advantage of the multilevel growth curve models is that these models use all available data regarding neighborhood poverty and college-educated residents, so respondents who may have dropped out at Waves II or III, but were interviewed at Wave IV, are retained in the analysis. The analytical sample is 13,603 individuals. A weighted comparison of means reveals that the analytical sample differs only marginally from the full Wave I sample in terms of race and ethnicity, family background, and neighborhood attainments. For example, the percentage of neighbors who are college educated is 22.7 for the analytical sample, compared to 22.5 for the full sample.

Neighborhoods are defined as respondents' census tracts at each wave. Though not necessarily in line with respondent's subjectively-defined neighborhoods, census tracts allow use of census and American Community survey data and facilitate comparisons to previous studies on locational attainment. Neighborhood characteristics are provided by the Add Health Contextual Databases at each wave (Billy, Wenzlow and William Grady 1997; Swisher 2009). Wave I and II residences are linked to data from the 1990 census, Wave III to the 2000 census, and Wave IV to five year estimates (2007-

2011) from the American Community Survey. Missing geographical identifiers at each wave are fairly negligible.

Dependent Variables

   Neighborhood poverty is measured at each of the four waves as the proportion of families below the federal poverty line. In addition, we assess at each wave the proportion of adults (age 25 or older), who have completed a college education or more (*neighborhood college educated*). These measures are consistent with studies within the locational attainment and neighborhood literatures, and help to capture elements of both economically-based disadvantage (i.e., neighborhood poverty), and human capital-related advantage (i.e., neighborhood college-educated). Single items are used, instead of multi-items scales, to facilitate interpretability and comparisons to previous studies. Interpretability is also aided by multiplying each measure by 100, thus converting proportions into percentages ranging from 0 to 100.

Independent Variables

   Race and ethnicity come from respondent self-reports, resulting in mutually exclusive categories of non-Hispanic *white* (n = 7707), non-Hispanic *black* (n = 2866), non-Hispanic *Asian* (n = 839) and those of *Hispanic* origin (n = 2191). Hispanic origin is further disaggregated into *foreign-born Hispanic* (n = 507) and *native-born Hispanic* (n = 1684). Native Americans and persons of other races are not included due to their small numbers in the sample. Due to their relatively small numbers, we do not differentiate foreign-born versus native-born Asians. Exploratory comparisons also suggested that this distinction was less critical to the neighborhood attainments of Asian respondents, than it was for Hispanics. This is consistent with past work on the locational attainments of

Asian subgroups (White and Sassler 2000).

Gender is coded dichotomously, with *females* as 1 and males 0. Household structure is denoted by an indicator for whether respondents lived at Wave I with: both biological parents, one biological parent and a *step-parent*, *single mothers*, *single fathers*, *other family members*, and those who *lived alone*. Family socioeconomic status (*family SES*) is measured using a scale (Ford, Bearman, and Moody 1999) that combines measures of parents' educational attainment (ranging from 1 for those without a high school degree to 5 for those with more than a college degree) and occupational status (ranging from 0 for the unemployed to 5 for those in managerial or professional occupations). When two parents are present in the household, the measure uses the higher of the two scores for both education and occupational status. The two scores are then combined to yield a measure ranging from 1 to 10.

Educational attainment was assessed at Wave IV. Respondents reported all of the degrees that they had received, as well as the years of their completion. Three categories were created, representing 1) those who completed a four-year *college degree or more*, 2) those completing two-year degrees or technical/vocational degrees (*certification*), and 3) those not completing any post-secondary education (the excluded comparison group). As we are primarily interested in the role of completion of post-secondary education, we do not include an analysis of high school completion in the person-specific discontinuity models (described below).

Moves across state lines was based on respondents' Wave IV reports that they currently lived in a different state than at Wave III. They also provided the year that they moved to their current state, which is used in the growth curve modeling.

In supplemental analyses, we assessed a variety of additional measures to capture other aspects of respondents' life course situations at Wave IV. Current work status is measured as the number of work hours per week. Family formation is indicated by the variables: married with resident children, married without children, cohabiting with and without a child, and single with and without a child. Work status is differentiated in terms of full-time, versus part-time, versus not employed. Indicators for current military service, self-described homemaker status, and unemployment are also used. Public assistance at Wave IV is an indicator representing respondents who answered yes to receiving AFDC, public assistance, welfare or food stamps in the past year. Due to uncertainty regarding the temporal ordering of these variables, with respect to the intercepts and slopes of our growth curves, we are not able to include them in the main results presented. However, sensitivity analyses indicate that their inclusion does not change the pattern or statistical significance of the results presented.

Hierarchical Growth Curve Models with Person-Specific Discontinuities

Trajectories of neighborhood poverty and neighborhood college-educated are estimated using two-level growth curve models, with multiple observations of neighborhood attainment measured across the four waves (i.e., within-person changes at level 1) nested within individuals (between-person characteristics at level 2). Taking neighborhood poverty as an example, at level 1, within-person variation in neighborhood poverty across time is modeled as a function of time, coded as 0 at Wave I, 1 at Wave II, 6 at Wave III, and 13 at Wave IV, reflecting the lag in years between waves. Time squared is also included in the model. Model comparisons using linear, squared, and cubic time specifications revealed that a model including a linear and squared term for

time provided the best model fit. At level 2, the intercept and slopes from the level 1 model are allowed to vary randomly across persons and modeled as functions of individual characteristics. For example, the models assess whether racial and ethnic subgroups have different intercepts and slopes for their neighborhood poverty trajectories. Indicators for racial and ethnic groups are entered as un-centered, allowing us to interpret the intercept as the expected neighborhood attainment for the excluded category of white respondents. All other level-two variables are grand-mean centered.

To assess the role of educational degree completion and moving to a different state, we extend the basic growth curve model to allow person-specific discontinuities (Singer and Willett 2003). Although traditional growth curve models allow the intercept and slope to vary randomly across persons, they are often designed so that changes in the intercept or slope happen at the same time for everyone. However, respondents in our sample complete their degrees and change residences at different times (and sometimes not at all). Addressing this issue is particularly important given the multiple-cohort design of Add Health which includes a range of ages at each wave (e.g., 18 to 25 at Wave III). The person-specific discontinuities model allows an individual's trajectory to change in level, slope, or both at any time. The models are parameterized such that changes in intercept and slope occur at the time that a respondent completes a post-secondary degree or moves to a different state. More technically speaking, these variables are treated as time-varying, and entered at level 1 to predict within-person changes in neighborhood attainments. Thus, completion of a college degree may be associated with a one-time decrease in neighborhood poverty (i.e., a change in level) at the time of completion, as well as a gradual change in neighborhood poverty over time (i.e., a change in slope).

These hierarchical models are estimated using HLM (Raudenbush and Bryk 2002).

Models are weighted at level-two (between persons) using the Add Health project's

longitudinal survey weights (GSWGT4_2).

Results

Descriptive Statistics

Descriptive statistics suggest considerable inequality in neighborhood poverty and

neighborhood college-educated across racial and ethnic subgroups (Table 1). Highest

neighborhood poverty is observed, in both adolescence (21.95 percent) and adulthood

(18.65 percent), among black respondents, followed by foreign-born Hispanics (18.13

percent at Wave I, but dropping to 13.79 percent at Wave IV). Lowest neighborhood

poverty is observed at both time points among Asians and whites (i.e., 7.93 percent and

9.04 percent, respectively at Wave I). Over time, both Asian and white respondents

experience a slight increase in neighborhood poverty, though both groups remain

advantaged in adulthood relative to other groups. Similar patterns of inequality, though

somewhat less pronounced, are observed for the percent of neighbors who are college-

educated. Most advantaged are Asian respondents (27.86 percent at Wave I, and

increasing to 33.25 percent at Wave IV), followed by whites (23.61 percent at Wave I).

<< Table 1 About Here >>

Group Differences in Trajectories of Neighborhood Poverty

The results of the first set of two-level growth curve models are presented in

Table 2, with neighborhood poverty in the first two left-hand columns, and the percent of

residents with a college degree or more in the right-hand columns. As noted before, models with linear and squared terms for time provided the best model fit. Model 1, for both outcomes, examines how trajectories (defined by intercepts, time, and time-squared) vary across groups, controlling only for age and gender.

<< Table 2 About Here >>

Starting with neighborhood poverty, the intercept of 9.012 represents the baseline neighborhood poverty rate for white adolescents at Wave I. Most disadvantaged are black youth, who start out in neighborhoods with 13.194 percentage points higher poverty. Hispanic respondents are also disadvantaged relative to whites, with foreign-born and native Hispanics living in neighborhoods with 9.144 and 4.348, respectively, percentage points higher neighborhood poverty than white adolescents. Asian youth start out in the most advantaged neighborhoods (1.263 percentage points lower than whites). Model 2 adds controls for family SES and household structure at Wave I. All group differences (compared to whites) retain statistical significance, which is supportive of place stratification theory. That these differences are also somewhat attenuated provides partial support for the spatial assimilation model.

Inequalities at baseline are less pronounced for the percentage of neighbors with college educations. The intercept indicates that white adolescents start out in neighborhoods in which 23.696 percent of their adult neighbors have four-year college degrees (or more). Black youth are again least advantaged, starting out in neighborhoods with 4.387 percentage points fewer college-educated neighbors than whites. Foreign-born Hispanic youth start out in neighborhoods almost as disadvantaged as blacks (i.e., 3.789 percentage points fewer than whites). Native-born Hispanic adolescents live in

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neighborhoods with 1.927 percentage points fewer college-educated neighbors than whites. Asian youth are again the most advantaged, beginning with a full 4.136 percentage points higher college-educated neighbors than whites. Inequalities in college-educated neighbors are more strongly attenuated when controlling for family SES and household types. This is particularly true for the Hispanic subgroups, with neither group being statistically different from whites in Model 2, a pattern consistent with our spatial assimilation hypothesis.

Interpretations are less intuitive for the linear and squared coefficients for time, which capture changes in neighborhood poverty and college-educated between adolescence and early adulthood. Thus we present them graphically in Figures 1 and 2, based on the Model 1 coefficients. With respect to neighborhood poverty, white and Asian respondents experience the lowest levels over time, with both groups consistently hovering between 8 and 9 percent of poor families in their neighborhoods. Black respondents experience improvements in neighborhood attainments over time, dropping from about 22 percent neighborhood poverty in adolescence to 18.8 percent in early adulthood. Foreign-born Hispanics experience considerable reductions in neighborhood poverty, from 18.2 percent in adolescence to just under 14 percent in early adulthood, virtually matching the attainments of their native-born counterparts, a pattern again consistent with the spatial assimilation model. Overall, inequalities in neighborhood poverty are reduced over time, though black and Hispanic groups remain disadvantaged in adulthood relative to whites and Asians.

<< Figure 1 About Here >>

A different set of patterns is observed with respect to changes in the percentage of college-educated neighbors (see Figure 2). In general, inequalities in neighborhood college-educated are less pronounced in adolescence, but widen slightly over time. Asian respondents begin in the most advantaged neighborhoods, and widen that advantage over time, from 27.8 percent of neighbors with a college-degree in adolescence to over 33 percent in early adulthood. Whites are the next most advantaged, increasing from 23.7 percent in adolescence to 26.2 percent in early adulthood, with a slight curvilinear dip in the middle. This curvilinear pattern is more pronounced for blacks, foreign-born Hispanics, and native-born Hispanics. For example, the percentage of neighbors with a college degree for foreign-born Hispanics drops from 19.9 percent in adolescence to 16.5 percent in the transition to adulthood, before rising to 22.1 percent in early adulthood, where they again nearly match the neighborhood attainments of native-born Hispanics (22.5 percent in early adulthood). Though showing a slight overall gain in the percentage of neighbors with a college degree, black respondents remain the most disadvantaged in early adulthood.

<< Figure 2 About Here >>

Post-Secondary Educational Completion

That blacks and Hispanics remain disadvantaged relative to whites (after controlling for family background) in both adolescence and young adulthood is consistent with the place stratification model. However, place stratification theory further predicts that minority groups will receive different returns to their emerging socioeconomic resources. We turn next to this question, by examining interactions between each group and completion of four-year college and two-year post-secondary degrees (certifications).

These models are presented in Table 3. As described previously, the person-specific discontinuity models allow changes in trajectories (both levels and slopes) at the specific time that an individual completed their degree(s). Model 1, for each outcome, is a saturated model that tests whether the intercept and slopes change for all groups. Model 2 shows reduced models that only include group differences that are statistically significant. We will focus on the Model 2 results.

<< Table 3 About Here >>

With respect to neighborhood poverty, completion of a college degree is not associated with a point-in-time reduction neighborhood poverty for whites, however they do experience a reduction in neighborhood poverty over time of -0.194 percentage points each year. In contrast, black and foreign-born Hispanic respondents experience considerable point-in-time reductions in neighborhood poverty (i.e., -2.672 and -3.057 percentage points, respectively). Native-born Hispanics see a -1.213 percentage point decrease in neighborhood poverty at the time of college completion, which while consistent with theoretical prediction is only marginally significant. Groups do not differ in their yearly decreases in neighborhood poverty following college completion (i.e., all receive a 0.194 percentage point decrease per year). Completion of a two-year degree is not associated with a change in the level of a person's trajectory, though it does confer a reduction in neighborhood poverty over time (i.e., -0.153 percentage points each year) for all groups.

Turning next to the percentage of neighbors who are college-educated, completion of a college degree is associated with a one-time increase in the level of the trajectory of 3.990 percentage points for all groups, except Asians who experience an

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overall decrease of 2.05 percentage points (i.e., 3.99 – 6.04 = 2.05). Black and Hispanic sub-groups do not differ from whites in the one-time change in neighborhood college-educated associated with completion of a four-year college degree.

Completion of a college degree is also associated with a change in slope, such that each year following completion is associated with a 0.697 percentage point increase in neighborhood college-educated. This gradual increase is not experienced, however, by blacks or native-born Hispanics. For example, the 0.697 percent boost that whites experience is offset by a group-specific -0.588 coefficient for native-born Hispanics. In contrast, Asians gain the most over time from completion of a college degree (i.e., almost a full percentage point increase each year compared to whites). Thus, the slight decrease in level that Asians experience at the point of four-year college completion is quickly offset by annual improvements. In contrast, completion of a two-year degree (or certification) is not associated with a change in the level of a person's trajectory, though it is associated with a 0.30 percentage point increase in neighborhood college-educated each year.

Moving to a Different State

Next, we examine group differences in changes in neighborhood attainments that are associated with long-distance residential mobility (i.e., moving to a different state). Models are presented in Table 4. We focus again on group differences that are statistically-significant in Model 2 for each outcome.

<< Table 4 About Here >>

Though moving to a different state is not associated with one-time or gradual changes in neighborhood poverty for all groups, black and foreign-born Hispanic

respondents do experience one-time reductions. For example, black respondents who change states between Waves 3 and 4 see a 2.773 (-0.021 – 2.752 = 2.773) percentage point decrease in neighborhood poverty. Foreign-born Hispanics experience an even larger 3.678 percentage point decrease in neighborhood poverty upon moving to a different state. With respect to neighborhood college-educated, all groups appear to benefit equally from a one-time increase of 3.913 percentage points at the time moving to a different state.

Sensitivity Analyses: Other Adult Transitions

As a final set of sensitivity analyses, we ran models taking into account other adult transitions that might be associated with changes in neighborhood attainments, such as union formation (marriage, cohabitation), childrearing, military service, employment, and home-ownership. Due to uncertainty regarding the timing of many of these transitions, we could not include them in the models in the same way as educational completion (i.e., person-specific discontinuities could not be modeled). Instead, we included indicator variables for these transitions in the level-two slope models predicting yearly changes in neighborhood attainments between Waves I and IV. Results (available upon request) show that marriage, not residing with a child, and employment were all associated with decreases in neighborhood poverty (and increases in neighborhood college-educated) between adolescence and early adulthood. Inclusion of these variables, however, did not change the previously reported pattern of results regarding racial and ethnic inequalities, nor group differences in locational returns to higher education or residential mobility.

Discussion

  This paper contributes to the emerging literature on locational attainments across the life course. It does so by modeling trajectories of neighborhood poverty and neighborhood college-educated from adolescence through the transition to adulthood, and into early adulthood. Motivated by spatial assimilation, place stratification and life course hypotheses, it focuses on inequalities across racial and ethnic subgroups, and differences in the ability of groups to convert educational attainment and residential transitions into locational gains.

  The findings provide partial support for each of these theoretical perspectives. In support of spatial assimilation theory, adolescent inequalities in neighborhood college-educated between Hispanic subgroups and whites all but disappear (and lose statistical significance) when controlling for family socioeconomic status and family structure. Moreover, all groups benefit (to varying degrees) from their own socioeconomic gains in the form of four-year college and two-year degree completions. In addition, foreign-born Hispanics are found to make larger gains in reducing neighborhood poverty than their white counterparts. Foreign-born Hispanics also share in the gains over time that white respondents receive (for college completion) with respect to increases in the percentage of neighbors who are college-educated – gains over time that black and native-born Hispanics do not experience. In adolescence, foreign-born Hispanics start out nearly as disadvantaged as black respondents, but converge by young adulthood to the neighborhood attainments of native-born Hispanics (though both groups remain disadvantaged relative to whites and Asians in early adulthood).

The continuing importance of place stratification theory, however, is indicated by the fact that inequalities across groups in both adolescence and young adulthood persist after controlling for family background characteristics, and one's own post-secondary attainments. Thus, the results provide further evidence of the durability of inequalities in neighborhood attainment (Sampson 2009; Sharkey 2013). At the same time, subtle differences are observed across the dual outcomes of neighborhood poverty and neighborhood college-educated. Most disadvantaged for both outcomes, and across the life course, are black respondents. Hispanic respondents are observed to occupy an intermediate position in terms of neighborhood poverty, and are not statistically different from whites and Asians on neighborhood college-educated, controlling for family background. Most clearly advantaged are Asians, particularly with respect to neighborhood college-educated. Though Asians are not the traditional focus of studies of locational attainment research, the size of their locational advantages in the present study suggests the need for further research to more fully understand its sources.

Inequalities are greatest in adolescence for neighborhood poverty, compared to those observed here for neighborhood college-educated. However, inequalities in neighborhood poverty decrease considerably between adolescence and young adulthood, whereas group differences persist and in some cases increase for neighborhood college-educated. That inequalities in neighborhood college-educated grow over time is consistent with other research suggesting the growing importance of residential segregation by education (Domina 2006; Massey, Rothwell, and Domina 2009).

With respect to the strong versus weak versions of place stratification theory, and group differences in locational gains associated with four-year and two-year degrees, the

findings are largely consistent with the weak version, though less so in the case of the neighborhood college-educated outcome. Neither whites nor Asians experienced a reduction in neighborhood poverty at the time of completion of a four-year degree. In contrast, and consistent with the predictions of the weak version of place stratification, black and Hispanic respondents (both foreign-born and native-born) saw considerable decreases in neighborhood poverty. This is consistent with the findings of Swisher, Kuhl and Chavez (2013) for the transition to adulthood, yet here we see that this pattern extends further into young adulthood. This was an open question, given the findings of Sharkey (2012), who observed some gains for black respondents early in the transition to adulthood, which tended to erode later in adulthood as the neighborhoods into which they moved became more disadvantaged over time.

The results for neighborhood college-educated are more suggestive of such temporary gains. Whereas all groups experienced an increase in the percentage of neighbors who are college-educated at the point of their own college completion, some groups (including whites, Asians, and foreign-born Hispanics) also enjoyed continuing improvements in neighborhood college-educated in the years following college completion. Black and native-born Hispanic respondents did not experience these on-going gains.

Though we were able to differentiate the experiences of those completing two-year versus four-year college degrees, lack of data regarding the characteristics of post-secondary institutions precluded an examination of differences within the post-secondary degree level (e.g., by college selectivity or majors). Given the growing horizontal differentiation of higher education in terms of selectivity and quality, and the higher

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economic returns for those with advanced degrees (post-bachelor), future locational attainment research should consider further disaggregations of post-secondary experiences (Torche 2011: 798). Future research using Wave V data of Add Health may be able to extend these analyses to consider the strong possibility of different attainment patterns within advanced degree levels.

This analysis also examined group differences in changes in neighborhood attainments associated with residential mobility. Black and foreign-born Hispanics experienced larger reductions in neighborhood poverty (than did whites) at the time of moving to a different state. This is partly consistent with research by Sharkey (2012), though the gains of black respondents were lost over time as the neighborhoods into which they moved deteriorated. This pattern of losses over time was not observed in the Add Health data, though we were only able to examine the timing of moves between waves III and IV. In contrast, all groups experienced the same one-time increases in the percentage of college-educated neighbors upon moving to a different state. This finding is consistent with Sampson and Sharkey's (2008) findings within the PHDCN regarding the benefits all groups received from moving outside Chicago in terms of neighborhood median family incomes (see also Sampson 2012). Sharkey (2008) similarly found moves outside one's county of origin to be positively associated with upward neighborhood mobility. Our results, and those of others, are consistent with the idea that getting outside of the local structures of inequalities in which one grows up (that extend beyond the scope of a neighborhood to encompass sectors of a city, or entire metropolitan areas), is important for upward neighborhood mobility.

It is recognized that moving to a different state is a somewhat crude way to measure distance of moves. In supplemental analyses, we were able to measure the distance of moves in miles between respondents' neighborhoods in adolescence and those in early adulthood. Due to data limitations, however, we are unable to determine the timing of these moves, and hence could not include these more finely graded distances in our person-specific discontinuity models. Instead we simply examined how the distance moved affected the slope of the trajectories, recognizing that this introduced an unknown and varying degree of problem with temporal ordering. Nonetheless, the findings suggested that the distance required to produce a change in neighborhood attainments was fairly short (e.g., as few as 10 miles in the case of neighborhood poverty), and that further moves did not tend to produce larger gains in neighborhood attainments.

Future research should examine additional characteristics associated with residential mobility, such as the reasons behind a move, which are unfortunately not available within Add Health. For example, long distance moves to attend college or take a new job are likely to result in considerable improvements in neighborhood characteristics, whereas long distance moves without a job or in search of better prospects would have much more uncertain returns. Recent research on regional differences in the prospects of social mobility (Cheetty et al. 2014), and research into metropolitan area variations in neighborhood mobility (Crowder, Pais, and South, 2012; Pais, South, and Crowder, 2012), suggest the importance of taking into consideration the characteristics (e.g., levels of residential segregation, immigrant composition, poverty rates, etc.) of the regions and metropolitan areas into which people move. Though the Add Health

contextual datasets do not contain metropolitan area level data, future research might explore the role of state or regional variations in neighborhood mobility.

Several further limitations of the analysis should be noted. First is that there is likely some degree of unobserved heterogeneity associated with pursuit of higher education and long distance moves that may account for some of the observed findings. However, it is less clear why those unobserved factors would vary by race and ethnicity in a way that explains the differing associations of these resources with changes in neighborhood poverty. Moreover, our analysis of the locational attainment process itself is consistent with Sampson's (2012) call to open up the black box of the neighborhood selection process, and treat selection as an outcome of substantive interest in itself, not merely a methodological nuisance.

As a school based sample, Add Health is likely to miss some of the most disadvantaged youth who have already dropped out of the school system, and hence the degree of inequality in neighborhood attainments observed is likely somewhat underestimated. Lastly, we note that the source of data for neighborhood poverty and college-educated changes between Waves III and IV, as at Wave IV census tract data are based on five-year estimates from the American Community Survey, whereas Waves I through III are based on the decennial censuses.

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Table 1. Selected Descriptive Statistics for Racial and Ethnic Subgroups					
			Foreign-Born	Native	
	White	Black	Hispanic	Hispanic	Asian
Neighborhood Percent Below Poverty					
Wave I	9.04	21.95	18.13	13.43	7.93
Wave II	9.01	22.10	17.89	13.43	8.02
Wave III	8.85	19.18	16.56	12.80	9.88
Wave IV	9.53	18.65	13.79	13.14	8.69
Neighborhood Percent College-Educated					
Wave I	23.61	19.19	19.60	21.63	27.86
Wave II	23.56	19.07	19.40	21.43	27.99
Wave III	23.65	18.02	16.41	20.20	29.79
Wave IV	26.25	20.79	22.20	22.50	33.25
Background Characteristics (Wave I)					
Lived with Two Biological Parents	0.63	0.31	0.58	0.59	0.71
Lived with a Step-parent	0.17	0.13	0.17	0.14	0.08
Lived with Single Mother	0.14	0.42	0.19	0.20	0.13
Lived with Single Father	0.03	0.02	0.03	0.02	0.02
Lived with Other Family	0.03	0.11	0.04	0.04	0.04
Lived Alone	0.00	0.01	0.00	0.00	0.00
Family Socioeconomic Status	6.41	5.61	3.77	4.96	6.49
Educational Attainment and Moving (by Wave IV)					
No High School Degree	0.07	0.11	0.15	0.11	0.03
High School Degree (or Some Post-Secondary)	0.41	0.50	0.44	0.48	0.31
Vocational or Associate Degrees	0.17	0.15	0.20	0.20	0.17
Four-year College Degree or Higher	0.34	0.23	0.20	0.20	0.48
Moved to Different State	0.33	0.28	0.18	0.24	0.30
Number of respondents	7707	2866	507	1684	839
Notes:					
Descriptive statistics weighted using AddHealth project longitudinal weights (GSWGT4_2).					

Table 2. Growth Curve Models of Neighborhood Poverty and Neighborhood College-Educated							
	Neighborhood Poverty				Neighborhood College-Educated		
	(1)		(2)		(1)		(2)
Baseline Intercept							
Intercept	9.012 ***		9.296 ***		23.696 ***		23.410 ***
	(0.131)		(0.126)		(0.199)		(0.186)
Black	13.194 ***		11.671 ***		-4.387 ***		-2.716 ***
	(0.432)		(0.418)		(0.379)		(0.375)
Hispanic Foreign-born	9.144 ***		6.160 ***		-3.789 ***		1.031
	(0.738)		(0.738)		(0.844)		(0.848)
Hispanic Native	4.348 ***		2.645 ***		-1.927 ***		0.744
	(0.444)		(0.419)		(0.547)		(0.511)
Asian	-1.263 *		-1.130 *		4.136 ***		3.930 ***
	(0.635)		(0.564)		(0.880)		(0.796)
Linear Time							
Intercept	-0.086 *		-0.114 **		-0.173 **		-0.189 **
	(0.042)		(0.042)		(0.063)		(0.054)
Black	-0.656 ***		-0.510 ***		-0.357 **		-0.300 *
	(0.136)		(0.135)		(0.127)		(0.127)
Hispanic Foreign-Born	-0.033		0.406 *		-1.009 ***		-0.895 **
	(0.192)		(0.197)		(0.270)		(0.273)
Hispanic Native	-0.022		0.219 +		-0.394 *		-0.335 +
	(0.122)		(0.122)		(0.177)		(0.178)
Asian	0.615 ***		0.603 ***		0.481		0.478
	(0.218)		(0.219)		(0.349)		(0.349)
Family SES			0.167 ***				0.046 *
			(0.016)				(0.020)
Time - Squared							
Intercept	0.010 **		0.011 ***		0.028 ***		0.029 ***
	(0.003)		(0.003)		(0.005)		(0.005)
Black	0.027 **		0.018 +		0.021 *		0.018 +
	(0.010)		(0.010)		(0.010)		(0.010)
Hispanic Foreign-Born	-0.026 +		-0.052 ***		0.076 ***		0.071 ***
	(0.015)		(0.015)		(0.021)		(0.021)
Hispanic Native	-0.003		-0.018 +		0.020		0.017
	(0.010)		(0.009)		(0.013)		(0.013)
Asian	-0.045 **		-0.044 *		-0.020		-0.020
	(0.017)		(0.017)		(0.025)		(0.025)
Family SES			-0.010 ***				-0.002
			(0.001)				(0.002)
Continued on next page							

Table 2. (Continued) Growth Curve Models

	Neighborhood Poverty		Neighborhood College-Educated	
	(1)	(2)	(1)	(2)
Controls				
Age	-0.135 **	-0.189 **	0.057	0.161 +
	(0.050)	(0.048)	(0.082)	(0.076)
Female	0.022	-0.146	-0.173	0.155
	(0.178)	(0.169)	(0.284)	(0.260)
Step-parent household		0.590 **		-0.578
		(0.228)		(0.352)
Single mother household		1.692 ***		-0.309
		(0.249)		(0.349)
Single father household		0.009		1.181
		(0.478)		(0.791)
Other family household		2.062 ***		-1.364 *
		(0.543)		(0.566)
Lives Alone		1.832		0.551
		(2.159)		(2.756)
Family SES		-1.110 ***		1.838 ***
		(0.050)		(0.063)
Variance Components				
Between-individual	41.894 ***	37.181 ***	117.940 ***	92.952 ***
Within-individual	49.285	48.684	99.930	99.830
*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10				
N is 13,567 individuals, and 48,351 observations over time.				

Table 3. Growth Curve Models of Neighborhood Poverty and Neighborhood College-Educated				
	Neighborhood Poverty		Neighborhood College-Educated	
	(1)	(2)	(1)	(2)
College Degree (Intercept Change)				
Intercept	-0.072	0.005	3.589 ***	3.990 ***
	(0.323)	(0.298)	(0.625)	(0.549)
Black	-2.058 *	-2.672 ***	1.541	
	(0.980)	(0.745)	(1.448)	
Hispanic Foreign-born	-1.608	-3.057 **	0.481	
	(1.915)	(1.329)	(3.654)	
Hispanic Native	-1.665 +	-1.213 +	3.049	
	(1.008)	(0.703)	(2.304)	
Asian	0.420		-5.707 *	-6.040 *
	(1.107)		(2.488)	(2.454)
College Degree (Slope Change)				
Intercept	-0.165 **	-0.194 ***	0.739 ***	0.697 ***
	(0.057)	(0.051)	(0.120)	(0.112)
Black	-0.173		-0.641 *	-0.453 **
	(0.175)		(0.285)	(0.175)
Hispanic Foreign-Born	-0.411		0.050	
	(0.430)		(0.736)	
Hispanic Native	0.082		-0.995 *	-0.588 *
	(0.191)		(0.407)	(0.242)
Asian	-0.119		0.966 *	0.999 *
	(0.222)		(0.449)	(0.442)
Certification (Intercept Change)				
Intercept	0.224	-0.072	-1.180 *	-0.865
	(0.381)	(0.352)	(0.591)	(0.530)
Black	-1.023		0.426	
	(1.475)		(1.183)	
Hispanic Foreign-Born	-0.589		6.536	
	(2.654)		(3.515)	
Hispanic Native	-1.062		1.392	
	(1.222)		(2.616)	
Asian	-1.403		-1.901	
	(1.228)		(2.479)	
Certification (Slope Change)				
Intercept	-0.173 **	-0.153 **	0.295 **	0.300 ***
	(0.059)	(0.058)	(0.098)	(0.086)
Black	0.057		0.094	
	(0.294)		(0.196)	
Hispanic Foreign-Born	-0.029		-0.556	
	(0.409)		(0.634)	
Hispanic Native	0.071		-0.041	
	(0.168)		(0.402)	
Asian	0.264		0.409	
	(0.268)		(0.375)	

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

N is 13,567 individuals, and 48,351 observations over time. Models include all previous control variables.

Table 4. Growth Curve Models of Neighborhood Poverty and Neighborhood College-Educated				
	Neighborhood Poverty		**Neighborhood College-Educated**	
	(1)	(2)	(1)	(2)
Leave State (Intercept Change)				
Intercept	0.319	-0.021	4.316 ***	3.913 ***
	(0.696)	(0.615)	(1.241)	(1.028)
Black	-3.192 +	-2.752 *	1.551	
	(0.742)	(1.067)	(2.493)	
Hispanic Foreign-born	-4.328	-3.657 *	5.458	
	(2.789)	(2.259)	(5.243)	
Hispanic Native	-2.991		-5.013	
	(2.618)		(3.857)	
Asian	-2.170		-9.165 **	
	(2.242)		(3.127)	
Leave State (Slope Change)				
Intercept	-0.156	-0.114	-0.194	-0.118
	(0.192)	(0.166)	(0.353)	(0.295)
Black	0.077		-0.557	
	(0.536)		(0.707)	
Hispanic Foreign-born	0.150		-0.268	
	(0.570)		(1.376)	
Hispanic Native	0.313		1.069	
	(0.742)		(1.284)	
Asian	0.279		1.778	
	(0.542)		(1.065)	

*** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10

N is 13,567 individuals, and 48,351 observations over time. Models include all previous control variables.
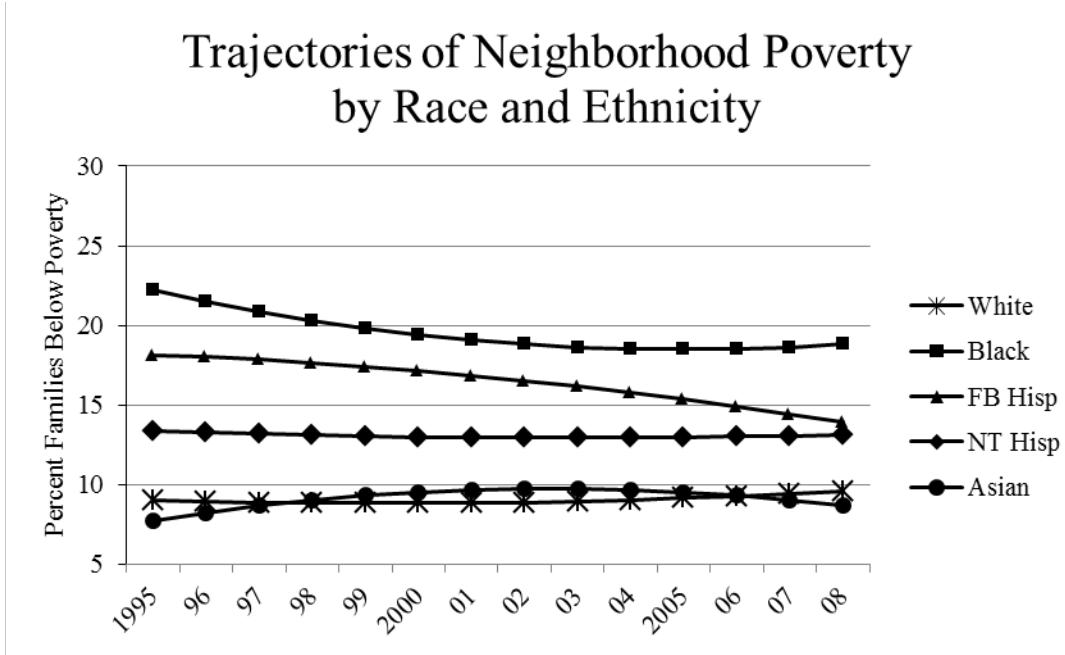
FIGURE 1

Trajectories of Neighborhood Poverty by Race and Ethnicity

FIGURE 2

Trajectories of Neighborhood College-Educated by Race and Ethnicity