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Neighborhood Attainment over the Adult Life Course

Scott J. South,[a] Ying Huang,[a] Amy Spring,[b] and Kyle Crowder[c]

Abstract

This study uses data from the Panel Study of Income Dynamics, in conjunction with neighborhood-level data from the U.S. decennial census and American Community Survey, to examine the trajectory of individuals' neighborhood characteristics from initial household formation into mid-to-late adulthood. Multilevel growth curve models reveal both different starting points and different life course trajectories for blacks and whites in neighborhood economic status and neighborhood racial composition. Among respondents who first established an independent household during the 1970s, improvement in neighborhood income over the adult life course was substantially greater for white than for black respondents; the racial difference in the percentage of neighbors who were non-Hispanic white narrowed slightly with age. Racial differences in the characteristics of neighborhoods inhabited during adolescence help explain racial differences in starting points and, to a lesser extent, subsequent trajectories of neighborhood attainment. Residing in an economically advantaged neighborhood during adolescence confers greater subsequent benefits in neighborhood economic status for white than for black respondents. We use these findings to begin developing a life course perspective on neighborhood attainment.

Keywords

neighborhood, neighborhood attainment, race, life course, stratification

Recent research on how individuals and families attain residence in more or less desirable neighborhoods has begun to draw on the life course perspective (Swisher, Kuhl, and Chavez 2013; Wagmiller 2013). Studies in this emerging area explicitly acknowledge that, upon leaving the parental home and establishing their own households, youth tend to inherit their initial neighborhood attributes and qualities from their parents (Britton and Goldsmith 2013; Sharkey 2008). Subsequently, as youth age into middle and late adulthood, the types of neighborhoods they inhabit tend to change, both as a consequence of moving between different types of neighborhoods and because neighborhood conditions change around non-mobile individuals (Sharkey 2012). Although there is likely considerable variation in trajectories of neighborhood attainment, most residential moves will typically be to better-off neighborhoods, as increases in personal income and wealth over the working ages allow for the purchase or

[a]University at Albany
[b]Georgia State University
[c]University of Washington

Corresponding Author:
Scott J. South, Department of Sociology, University at Albany, SUNY, Albany, NY 12222
E-mail: s.south@albany.edu

rental of dwellings in more prosperous communities. The life course approach thus views neighborhood attainment, and socio-spatial mobility more generally, as a process that develops and changes as individuals age (Clark and Withers 2007; Coulter and van Ham 2013; Coulter, van Ham, and Findlay 2015; Geist and McManus 2008).

However, prior studies in this area have been quite limited in the length of time they are able to follow individuals through their "neighborhood life course." Most studies examine only neighborhood conditions at the time of initial household formation (e.g., Britton and Goldsmith 2013) or within a few years of establishing an independent household (e.g., Goldsmith 2016; Swisher et al. 2013; Wagmiller 2013). Consequently, we have little knowledge of how individuals' exposure to various neighborhood conditions changes over the bulk of the adult life course. Studies that explore the length of time that children (Timberlake 2007) and adults (Quillian 2003) spend in various types of neighborhoods do not trace the experiences of any actual cohort over a lengthy period of time. Similarly, cross-sectional studies comparing the neighborhood conditions of various age groups, including studies of residential segregation by age (e.g., Winkler and Klaas 2012), cannot capture the lived experiences and social pathways of any real cohort of individuals. And studies of how neighborhoods themselves change over time—for example, studies of the neighborhood life cycle (Guest 1974; Schwirian 1983)—cannot tell us how individuals' neighborhood environments change as they age.

In this article, we use data from the Panel Study of Income Dynamics (PSID), in concert with areal data from the U.S. decennial censuses and American Community Survey, to track the neighborhood characteristics of a nationally representative sample of individuals from initial household formation through middle-to-late adulthood. Our oldest sample members are in their late 50s when last observed. We focus on two salient neighborhood characteristics—economic status and racial composition—and pay particular attention to differences in the neighborhood trajectories of black and white respondents. We use multilevel growth curve models to describe individual trajectories in the economic and racial characteristics of neighborhoods and to explore how the characteristics of neighborhoods that individuals inhabited during adolescence shape both initial neighborhood characteristics upon the formation of an independent household and subsequent changes in neighborhood characteristics over the adult life course.

THEORETICAL BACKGROUND AND HYPOTHESES

The life course perspective is a useful theoretical orientation for exploring age-graded trajectories of neighborhood attainment (Elder, Johnson, and Crosnoe 2003; Giele and Elder 1998). The life course perspective directs attention to the social pathways of individual lives, especially as they are influenced by historical and socioeconomic context (Mitchell 2003). The life course approach is particularly concerned with lifelong developmental trajectories and the age-graded timing of critical personal events and transitions. But while the empirical life course literatures on such states and statuses as socioeconomic achievement (e.g., Cheng 2014), cognitive development (e.g., Richards and Hatch 2011), family structure (e.g., Bengtson and Allen 1993), health (e.g., Willson, Shuey, and Elder 2007), and criminal offending (e.g., Sampson and Laub 1992) have grown rapidly over recent years, the application of the life course perspective to the study of neighborhood attainment remains comparatively underdeveloped.

Although the life course approach remains primarily a theoretical orientation rather than a set of interrelated, falsifiable propositions (Mayer 2009), several principles of life course theory are germane to the study of neighborhood attainment. The *principle of life-span development* (Elder et al. 2003) holds that individual developmental processes unfold over the entire life course and that lives thus

need to be studied over lengthy periods of time. This principle recommends that studies of neighborhood attainment extend beyond the few years after youths have established an independent household to encompass the adult years. The life course *principle of time and space* (Elder et al. 2003) emphasizes how individual lives unfold in the context of broader trends and events. As we will argue, trends in racial residential segregation and neighborhood ecological differentiation more generally likely shaped the life course trajectories of neighborhood racial composition and economic status among individuals who left the parental home and established their own households in the 1970s. The life course *principle of linked lives* (Elder, Shanahan, and Jennings 2015) stresses the interdependence of states, events, and transitions among members of a shared social network. In the context of studying neighborhood attainment over the life course, this principle directs attention to how neighborhood context is passed from one generation to the next and how the geographic location of family and friends may impede or facilitate residential mobility out of origin neighborhoods and shape the characteristics of destination neighborhoods. The life course *principle of heterogeneity* (Mitchell 2003) calls attention to the substantial between-person variation in the age-graded ability to attain residence in different types of neighborhoods; as we will suggest, both spatial assimilation theory and place stratification theory imply that such heterogeneity is likely to be especially pronounced between black and white individuals.

Just as most people experience improvements in their economic status as they age (Fuller 2008), so too are people likely to experience improvements in the economic status of their neighborhoods. Although likely influenced by the characteristics of their origin neighborhoods, upon separating from one's parental family and establishing one's own household, initial neighborhoods of residence are likely to be relatively low in socioeconomic status (SES), commensurate with the low earnings and unstable employment that typify initial entry into the workforce. As incomes rise, individuals are able to afford residences in better neighborhoods and are thus likely to move to such areas (South and Crowder 1997). Associated life course changes, such as parenthood, could also propel migration into more economically prosperous neighborhoods, in part so that children can attend higher-quality schools (Goyette, Iceland, and Weininger 2014).

Of course, the ability to attain residence in more prosperous neighborhoods likely varies by individuals' own socioeconomic and family status and by broader macroeconomic trends. Job loss and divorce, for example, often impede the ability to move to better-off communities and avoid comparatively disadvantaged neighborhoods (South and Crowder 1998). Recent economic recessions and rising levels of income and wealth inequality (Oliver and Shapiro 2006; Shapiro 2004) may have contributed to increases in neighborhood socioeconomic differentiation, perhaps making it increasingly difficult to move from disadvantaged to advantaged areas. But such individual and temporal variability notwithstanding, it is reasonable to posit that, as they age, most people experience improvements in the socioeconomic status of their residential neighborhoods.

It is less clear how the ethno-racial composition of individuals' neighborhoods might change over the life course. On the one hand, to the extent that residence in a relatively high-SES neighborhood also means residence in a predominantly non-Hispanic white neighborhood, it stands to reason that as individuals age, their residential neighborhoods will be increasingly composed of more non-Hispanic white residents and fewer minorities. This expectation derives from the strong connection between neighborhood racial composition and neighborhood income. At the same time, however, the experiences of any single cohort will also be shaped by period-specific demographic forces, reflecting the life course perspective's emphasis on the salience of socio-historical location for both intra- and inter-cohort life course trajectories (Elder et al. 2015). Although

broad macroeconomic and demographic trends may shape the life course trajectory of neighborhood economic status, such forces are likely particularly influential for the life course trajectory of neighborhood racial composition. Most relevant here is the increasing ethno-racial diversity of U.S. neighborhoods over recent decades, which has reduced the percentage of non-Hispanic whites in many communities (South, Crowder, and Pais 2011). Increasing neighborhood ethno-racial diversity likely tempered, and perhaps even negated, increases over the life course in individuals' exposure to non-Hispanic white neighbors.

Race, Neighborhood Attainment, and the Life Course

Of course, in the United States, black and white individuals' neighborhood environments differ dramatically. Racial residential segregation, although decreasing slightly over recent years, remains a defining characteristic of the urban landscape (Lichter, Parisi, and Taquino 2015; Logan, Stults, and Farley 2004), and racial residential inequality remains pronounced (Firebaugh and Farrell 2016). Wilson's (1987) seminal thesis suggests that during the 1970s—the decade we first observe the cohort used in our analysis—poor blacks were becoming increasingly trapped in deteriorating, inner-city neighborhoods. The movement of jobs and some middle-class blacks out of the central city left behind a subpopulation of persistently poor blacks in neighborhoods suffering high unemployment, declining tax bases, dilapidated schools, elevated crime rates, and myriad other social ills. Although not explicitly adopting a life course perspective, Wilson's argument implies an increasing permanence across and within generations to many blacks' neighborhood location, frequently leaving them "stuck in place" (Sharkey 2013). In contrast, whites' prospects for improving their neighborhood environments were presumably immune to these forces.

Research on racial differences in neighborhood attainment is typically guided by one—or both—of two theoretical perspectives. The *spatial assimilation* model posits that patterns of residential differentiation by race and ethnicity emerge as people "match" their own socioeconomic status with that of their neighborhood, using their financial capital and other endowments to purchase residence in the most desirable neighborhoods. Residential mobility from less desirable to more desirable neighborhoods is considered a natural consequence of more general processes of social and economic mobility, especially for minorities and immigrants (Massey and Denton 1985). Given the correlation between neighborhood economic status and racial composition, on the one hand, and neighborhood housing values, on the other, advanced levels of human and financial capital are often prerequisites for purchasing residences in predominantly Anglo communities (Logan, Alba, and Leung 1996).

The *place stratification* model of neighborhood attainment draws attention to the barriers to residential mobility faced by black residents, especially in the form of housing discrimination (Fischer and Massey 2004; Galster 1991; Massey and Denton 1993). In this perspective, the discriminatory practices of real estate agents (Pearce 1979; Yinger 1995), local governments (Shlay and Rossi 1981), and mortgage lenders (Shlay 1988; Squires and Kim 1995) create a racially segmented housing market that obstructs African Americans' mobility aspirations, especially those who wish to move to racially integrated or middle-class neighborhoods. White individuals' stereotyping of, and hostility toward, black residents may also impede blacks' migration into racially mixed or predominantly white neighborhoods (Farley et al. 1994; Harris 1999; Krysan et al. 2009; Quillian and Pager 2001). Racial discrimination in housing is believed to impede the residential attainments of even middle-class blacks (Massey and Denton 1993; Patillo-McCoy 1999), and the neighborhoods inhabited by middle-class blacks frequently adjoin extremely disadvantaged areas (Sharkey 2014). The place stratification model also highlights majority groups' unwillingness to

share neighborhoods with minority residents and how white people in particular seek to vacate racially mixed areas (Crowder 2000; Krysan 2002; Quillian 2002; Wilson and Taub 2006).

But although both the spatial assimilation and place stratification models proffer causes of racial differences in neighborhood attainment, neither perspective specifies when in the individual life course such differences emerge, develop, peak, or (perhaps) decline. A life course approach to neighborhood attainment may help shed light on why blacks and whites tend to live in such different types of neighborhoods throughout their adult years. A central question addressed by our analysis is whether racial inequality in neighborhood environments during mid-adulthood is mainly a continuation of racial differences in neighborhood environments created upon initial household formation or, alternatively, whether such differences develop during the adult years. There are two emerging schools of thought on this issue. Recent work by Sharkey (2012, 2013) emphasizes racial differences in neighborhood characteristics at the time of initial household formation. Broadly illustrative of the life course principle of linked lives, Sharkey (2008) shows that the intergenerational transmission of neighborhood context is quite high. Furthermore, differences in neighborhood economic status between young blacks and whites are largely explained by neighborhood inequalities experienced by the prior generation. Marsh, Crowder, and Polimis (2011), Swisher and colleagues (2013), Britton and Goldsmith (2013), and Vartanian, Buck, and Gleason (2007) also find that neighborhood characteristics are fairly similar during childhood and young adulthood, particularly for people who remain in the same city or metropolitan area. This perspective—one of "durable inequality"—implies that racial differences in neighborhood attainment over the adult life course result mainly from racial differences in neighborhood environments when young adults first establish their own households. In this approach, the pivotal drivers of racial inequality in neighborhood attainment, such as differences in individual income (as emphasized by the spatial assimilation model) or housing discrimination (as emphasized by the place stratification model), operate mainly by determining the neighborhood attributes of prior generations. These drivers of racial inequality in neighborhood attainment might reinforce and maintain initial differences, but for the most part they do not modify these inequalities over the life course.

A second line of reasoning, while not disavowing the salience of racial neighborhood inequality inherited from prior generations, focuses on differences in the subsequent neighborhood trajectories of blacks and whites as they age. Neighborhood inequalities at the onset of the adult life course—even pronounced ones—do not negate the possibility that racial differences in neighborhood attainment are constructed or otherwise modified over the adult life course, either because of divergence between blacks and whites in individual socioeconomic attainments or because of contemporaneous discrimination in the housing market. In this approach, the key drivers of racial inequalities in neighborhood environments operate on adults themselves, with the inequalities in force at the time of initial household formation either exacerbated or attenuated during subsequent life course stages. Both the spatial assimilation and place stratification models seem to predict a widening of racial differences in neighborhood economic status over the life course. However, for reasons alluded to earlier, racial differences in the life course trajectories of neighborhood racial composition are more difficult to anticipate.

Racial differences in neighborhood economic status could widen over the life course for several reasons. Irrespective of the quality of their initial neighborhood of residence, as they age, white individuals could be more likely than black individuals to move to better neighborhoods (South and Crowder 1997), a divergence made possible both by superior increases in income and wealth among whites than among blacks over the life course

(Conley 1999; Oliver and Shapiro 2006), and by barriers to black individuals' residential mobility generated by a racially stratified housing market (Massey and Denton 1993). Stark racial differences in inherited wealth may not only create differences in neighborhood quality when blacks and whites initially form their households, but these differences may also accumulate over the life course, leading to shallower trajectories of neighborhood economic attainment for blacks than for whites. Although racial differences in wealth do not appear to explain racial differences in the racial composition of movers' destination neighborhoods at any single point in time (Crowder, South, and Chavez 2006), pronounced racial differences in the life course trajectories of wealth and income could contribute to racial differences in the life course trajectories of neighborhood economic status.

At the macro level, racial divergence in family structure contributes to a growing racial inequality in income (Bloome 2014; Eggebeen and Lichter 1991), and thus it is reasonable to posit that over the life course, higher rates of family disruption among blacks impede their ability to move to better-off neighborhoods at the same rates as do whites. Blacks may also be more constrained than whites to remain in, or move to, relatively disadvantaged neighborhoods to maintain geographic proximity to family members, an illustration of how the life course principle of linked lives may inform the study of neighborhood attainment. For example, McDonald and Richards (2008) find that, owing to culturally prescribed obligations, African American women are especially likely to move to neighborhoods inhabited by kin to provide social and economic support.

Although racial differences in the life course trajectories of neighborhood attainment could result from racial differences in inter-neighborhood migration behavior, they could also result from differences in how the neighborhoods inhabited by stationary blacks and whites change over time. The neighborhoods inhabited by non-mobile blacks and whites could change in different directions or at different paces due to changes in the economic status of non-mobile neighbors and to class-selective net migration (Solari 2012). Noteworthy in this regard is the tendency over recent decades for the types of neighborhoods whites often live in—generally well-off, mostly white, suburban—to improve in economic status, whereas the types of neighborhoods blacks typically inhabit—poorer, predominately minority, often inner-city—stagnate or decline economically (Owens 2012; Reardon and Bischoff 2011). Black individuals' initial intergenerational "inheritance" of relatively poor or predominantly minority neighborhoods (Sharkey 2008) could, given the patterns of economic and racial change in such communities, consign blacks to neighborhoods that exhibit different trajectories than the neighborhoods whites typically inhabit upon initially establishing an independent household.

There is some support for the idea that the degree of racial inequality in neighborhood environments changes over the adult life course. Contrary to our hypothesis that racial differences in neighborhood quality widen with age, Sharkey (2012) finds a trend toward racial equality in neighborhood economic status over the first few young adult years. But this convergence is limited to youth who migrate out of highly segregated metropolitan areas. Moreover, among black youth, these initial improvements in neighborhood economic status begin to dissipate in their late 20s and early 30s. Wagmiller (2013) also finds different trajectories of neighborhood ethno-racial diversity for blacks and whites over the nine-year period following the establishment of an independent household. But these prior studies of race-specific trajectories in neighborhood economic status and racial composition are limited to only a small segment of the adult life course, usually no more than a decade or so beyond initial household formation (cf. Sharkey 2012). Consequently, it has not been possible to determine the degree to which the neighborhood environments of blacks and whites change over most

of the adult life course, or the extent to which neighborhood racial inequality experienced in mid-to-late adulthood is attributable to a long-term influence of initial neighborhood environments.

Neighborhood Origins and Subsequent Destinations

A central tenet of the life course perspective is that early life experiences shape later-life outcomes (Elder et al. 2003; Giele and Elder 1998). This principle appears applicable to neighborhood attainment, in that residential segregation and neighborhood qualities are, to a significant extent, perpetuated over the early stages of the life course (Goldsmith 2016; Sharkey 2008; Swisher et al. 2013; van Ham et al. 2014). Neighborhood socioeconomic and demographic contexts experienced during adolescence are likely associated with later-life contexts for several reasons. First, social ties often keep young adults close to their childhood neighborhoods (Blaauboer 2013; Sharkey 2008). Second, growing up in a disadvantaged neighborhood can impair the development and accumulation of the human and financial capital that might facilitate geographic moves to more prosperous neighborhoods in later life (Corcoran et al. 1992; Galster et al. 2007; Wodtke, Harding, and Elwert 2011). And third, exposure to neighborhoods of a given racial composition during childhood might shape individuals' preferences for the racial composition of the neighborhoods they inhabit in later life (Britton and Goldsmith 2013; Marsh et al. 2011). But few studies examine how adolescent neighborhood experiences are associated with neighborhood contexts in mid-to-late adulthood, and thus it is unknown how long the "effects" of adolescent neighborhood contexts on subsequent neighborhood contexts last.

One possibility is that growing up in an economically advantaged neighborhood not only leads to an initial neighborhood of residence of high economic status, but through a process of cumulative advantage it generates an upward trajectory of improvements over the life course (DiPrete and Eirich 2006). Under this scenario, the advanced human capital and other benefits enjoyed by growing up in an economically advantaged neighborhood provide the resources to continuously improve one's neighborhood over time, most often by moving to more prosperous areas. These improvements in neighborhood economic status may themselves be reinforcing and cumulative, as increases in housing prices and thus home equity in better-off neighborhoods allow for the purchase of subsequent homes in even more prosperous communities. In contrast, growing up in an economically disadvantaged neighborhood not only leads to initially residing in a relatively poor neighborhood, but it also fails to produce the human and financial capital that could generate improvements in neighborhood status over the adult life course. If such neighborhood effects on human capital accumulation vary by race (Sharkey and Faber 2014), then it follows that the effect of adolescent neighborhood characteristics on the later-life trajectory of neighborhood status will also vary by race.

To sum up our expectations, we anticipate pronounced differences between blacks and whites in the economic status and racial composition of the neighborhoods they first inhabit upon establishing an independent household. We also expect to find greater long-term improvements over the adult life course among whites than among blacks in neighborhood economic status, but the overall and race-specific life course trajectories in neighborhood racial composition are difficult to anticipate given changes in neighborhood diversity and racial residential segregation that have occurred over recent decades. We hypothesize that the economic status (and perhaps racial composition) of the neighborhoods individuals lived in during adolescence will influence not only the types of neighborhoods they initially inhabit upon leaving the parental household, but also their subsequent trajectory of neighborhood characteristics over the adult life course. We also hypothesize that blacks are less able than whites to

convert advantageous neighborhood origins into desirable neighborhood environments later in life.

DATA AND METHODS

Data for this study come from three sources: the Panel Study of Income Dynamics (PSID), the 1970 to 2010 U.S. censuses, and the 2006 to 2010 American Community Survey (ACS). The PSID provides the survey respondents, and the censuses and ACS provide data on the economic and ethno-racial composition of the census tracts these PSID respondents inhabited throughout much of their adult years.

The PSID is a well-known longitudinal survey of U.S. residents and their families. Begun in 1968, members of the initial panel of approximately 5,000 families (about 18,000 individuals) were interviewed annually until 1997 and biennially thereafter. New families have been added to the panel as children and other members of original panel families formed their own households. By 2011, a cumulative total of over 9,000 families had been included in the survey panel, providing information on more than 70,000 individuals over the course of the study. Use of analytic sample weights allows us to make generalizations to the U.S. population (Hill 1992).

Sample. To examine trajectories of neighborhood change from initial household formation through middle-to-late adulthood, we selected a group of black and white offspring of the initial PSID respondents. These offspring were born between 1953 and 1962 and first became a household head sometime between 1970 and 1979. We followed these respondents through the 2011 wave of interviews. When first observed in the 1971 to 1980 PSID interviews, these respondents were between the ages of 18 and 27; when last observed in the 2011 interview, they were between the ages of 49 and 58.

Although selective sample attrition, including attrition across generations, has not impaired the overall representativeness of the PSID (Fitzgerald 2011), the amounts of annual non-participation and eventual sample attrition are nontrivial. Following in large part the work of Wagmiller (2013), we selected from the eligible PSID respondents those who were interviewed in at least half of the maximum number of waves they could have contributed to the analysis. For respondents who became a household head in 1970, this maximum is 34 interviews; for respondents who became a household head in 1979, the maximum is 25 interviews. This selection criterion results in an analytic sample of 518 black and 696 white (non-Hispanic) PSID participants. (The sample's relatively even racial distribution is due mainly to the PSID's initial oversampling of low-income households.) These 1,214 respondents comprise 73 percent of the total number of PSID respondents born in 1953 to 1962 who were ever observed to have formed an independent household during the 1970s. Importantly, however, our analytic sample closely resembles this larger group on key characteristics. For example, the mean neighborhood income of the analytic sample's origin families (see more detail below) is $59,710, compared with $59,270 for the sample of all eligible PSID respondents. The adolescent neighborhood environments of the two groups are also quite similar. During adolescence, respondents in the analytic sample lived in a census tract with an average family income of $55,680 and in which 85.38 percent of the tract population was non-Hispanic white; the corresponding figures for the sample of all eligible respondents are $55,530 and 84.89 percent, respectively. Given these similarities in observable attributes, it seems unlikely that differential sample attrition would seriously impair our analysis of trajectories in neighborhood attainments over the life course.

Dependent Variables

Following much prior work in this area, we use census tracts to represent neighborhoods. We focus on two critical characteristics of individuals' neighborhoods—their economic status and racial composition. Using both indicators acknowledges that salient neighborhood-based experiences may be influenced by a neighborhood's economic status and racial composition,

and that the growth of middle-class, predominantly African American neighborhoods in some metropolitan areas may have weakened the link between neighborhood SES and neighborhood racial composition. Studying the life course trajectories of both neighborhood economic status and neighborhood racial composition also acknowledges that, while most everyone presumably desires to live in the wealthiest possible neighborhood, blacks and whites exhibit different preferences for the racial composition of their neighbors (Wiese 2004). Blacks tend to prefer racially mixed neighborhoods, whereas most whites prefer predominately white areas (Krysan et al. 2009).

We measure the economic status of respondents' neighborhoods by their residential tract's average family income, in constant 2000 dollars. We measure the racial composition of respondents' neighborhoods by the percentage of the tract population that is non-Hispanic white. As noted earlier, these variables are computed from the 1970 to 2010 U.S. decennial censuses and the 2006 to 2010 American Community Survey, with tract boundaries normalized to 2010 (GeoLytics 2014). We use linear interpolation to estimate values for non-census years.

Independent Variables

Our focal independent variables are respondents' race, distinguishing black from non-Hispanic white PSID participants, and the average family income and percent non-Hispanic white of the neighborhoods respondents inhabited prior to leaving the parental home to form an independent household. These latter predictors, measured analogously to the dependent variables, are taken from the parental household interview in the year prior to the respondent becoming a household head (or the spouse or long-term cohabiter of a household head). For ease of presentation, we refer to these variables as respondents' adolescent neighborhood characteristics.

Our models also include several individual- and family-level characteristics shown in past research to affect neighborhood attainment. Respondent's marital status is measured by a dummy variable scored 1 for married or cohabiting respondents. Number of children refers to the total number of persons under age 18 in the respondent's household. Educational attainment is measured by completed years of schooling. Family income refers to total taxable income (in constant 2000 dollars) in the calendar year prior to the survey. Home ownership is measured by a dummy variable distinguishing owners from renters. We measure respondent's residential mobility by two dummy variables indicating whether, during the period preceding the interview, the respondent (1) moved to a different census tract within the same county or (2) moved to a different county. All of these variables are treated as time-varying covariates, measured at each interview.

Finally, because family income during adolescence could shape both adolescent neighborhood environments and subsequent neighborhood trajectories, we include the total family income of respondents' origin families. This variable is taken from respondents' parental questionnaires and refers to family income two years prior to the year respondents left the parental home to form an independent household.

Analytic Strategy

Following recent research in this area (e.g., Sharkey 2012; Wagmiller 2013), we estimate two-level growth curve models to depict age trajectories of neighborhood attainment and to explore heterogeneity in these trajectories by race and neighborhood experiences during adolescence. The models can be expressed as follows:

Level-1 Model:

$$y_{ti} = \beta_{0i} + \beta_{1i}\left(Age_{ti} - 18\right) + \beta_{2i}\left(Age_{ti} - 18\right)^2 + e_{ti} \quad (1)$$

Level-2 Model (model for the intercept):

$$\beta_{0i} = \gamma_{00} + \gamma_{01} Black + \gamma_{02} Adolescent\ Neighborhood\ Characteristics + \mu_{0i} \quad (2)$$

Level-2 Model (model for the linear rate of change):

$$\beta_{1i} = \gamma_{10} + \gamma_{11}Black + \gamma_{12}Adolescent\ Neighborhood\ Characteristics + \mu_{1i} \quad (3)$$

Level-2 Model (model for the quadratic rate of change):

$$\beta_{2i} = \gamma_{20} + \gamma_{21}Black + \gamma_{22}Adolescent\ Neighborhood\ Characteristics + \mu_{2i} \quad (4)$$

Our level-1 model characterizes within-individual change in the neighborhood outcomes over time. In this model of repeated measurements within individuals, the response variable y_{ti} for person *i* at time *t* is modeled as a function of linear and quadratic terms of age for person *i* at time *t*. The coefficients β_{0i}, β_{1i}, and β_{2i} in Equation 1 represent the intercept or mean level, the linear rate of change, and the quadratic rate of change in neighborhood characteristics with age, respectively. Following the hierarchical linear modeling literature (Singer and Willett 2003), we initiate the age variable at 18—the youngest age of the analytic cohort. This operationalization allows us to interpret the intercept and growth rate as the average neighborhood attainment and rate of growth at (or from) age 18. The level-2 analysis assesses the heterogeneity in change across individuals and examines the association between the key predictors and the shape of the growth trajectory. Specifically, we assess whether black and white respondents, and whether varying neighborhood experiences in adolescence, manifest different patterns of within-individual change. In Equations 2, 3, and 4, *black* is a dummy variable distinguishing black from white respondents, and *adolescent neighborhood characteristics* refers to the average neighborhood income and percent non-Hispanic white of respondents' adolescent neighborhood of residence. In the level-2 models, each parameter of the age trajectories, β_{0i}, β_{1i}, and β_{2i}, are modeled as functions of person-level attributes. The associated coefficients of these predictors are denoted as γ, where γ_{01} in Equation 2 is the coefficient for the intercept model that includes the main effects of race. γ_{11} in Equation 3 and γ_{21} in Equation 4 are the corresponding coefficients for the linear and quadratic rates of change models. In a similar vein, γ_{02}, γ_{12}, and γ_{22} capture the effects of neighborhood experiences in adolescence on the intercept, linear rate of change, and quadratic rate of change in neighborhood attainment trajectories over the life course. We enter the time-varying control variables (marital status, number of children, educational attainment, family income, home ownership, and residential mobility) at level 1 and the time-constant covariate (family income in adolescence) at level 2. We assume that the random within-person error term, e_{ti}, is normally distributed and that the level-2 residual random errors, μ_{0i}, μ_{1i}, and μ_{2i}, have a multivariate normal distribution.

RESULTS

Table 1 presents descriptive statistics for the variables used in the analysis, separately for the black and white PSID respondents. Immediately apparent are the very different types of neighborhoods inhabited by this cohort of black and white individuals during their adult years. The neighborhoods inhabited by the typical white respondent have an average family income over 40 percent higher than the neighborhoods inhabited by typical black respondents ($61,890 versus $43,470). And the racial difference in the ethno-racial composition of neighborhoods is even starker, with white respondents inhabiting neighborhoods whose population is, on average, 86 percent non-Hispanic white, and black respondents inhabiting neighborhoods whose population is only about one-third non-Hispanic white.

To a considerable extent, these differences echo the racial differences in neighborhood environments found in adolescence—that is, before members of this cohort established their own independent households. During adolescence, white respondents, on average, resided in a neighborhood with average family income of about $57,780, and over 92 percent of their neighbors were also non-Hispanic white. In contrast, during their adolescence,

Table 1. Weighted Descriptive Statistics for Variables Used in the Analysis of Neighborhood Attainment, by Race: Panel Study of Income Dynamics, 1971 to 2011

	White		Black		Pooled	
Variable	Mean	SD	Mean	SD	Mean	SD
Dependent Variables						
Neighborhood average family income at *t* (in 000s)	61.89	25.69	43.47	17.80	59.71	25.58
Neighborhood percent non-Hispanic white at *t*	85.62	16.24	34.31	29.24	79.55	24.66
Independent Variables						
Neighborhood average family income in adolescence (in 000s)	57.78	19.24	40.04	13.15	55.68	19.80
Neighborhood percent non-Hispanic white in adolescence	92.49	12.30	32.29	27.58	85.38	24.52
Married/cohabiting at *t*	.74	.44	.41	.49	.70	.46
Number of children under 18 years old at *t*	1.08	1.17	1.29	1.34	1.10	1.19
Years of education at *t*	13.52	2.67	12.33	1.86	13.38	2.62
Family income at *t* – 1 (in 000s)	65.42	72.43	37.26	32.79	62.10	69.54
Home ownership at *t*	.63	.48	.32	.47	.60	.49
Family income in adolescence (in 000s)	81.26	48.24	42.53	26.57	76.68	47.87
Moved to different tract in same county between *t* – 1 and *t*	.19	.39	.27	.44	.20	.40
Moved to different county between *t* – 1 and *t*	.08	.27	.07	.25	.08	.27
N of person-periods	16,141		11,096		27,237	
N of persons	696		518		1,214	

Note: Sample consists of black and white Panel Study of Income Dynamics respondents who established their own households between 1970 and 1979.

black respondents tended to reside in neighborhoods with average family income of about $40,000, and less than one-third of their neighbors were non-Hispanic white.

Racial differences in the other independent variables comport with well-known inequalities and disparities. White respondents were much more likely than black respondents to be married or cohabiting at each point in time over the life course, and black respondents had slightly more resident children. On average, white respondents had completed more years of schooling than black respondents, and white respondents enjoyed much higher family incomes, both contemporaneously and during adolescence. White respondents were almost twice as likely as black respondents to own their homes. Black respondents were more likely than white respondents to move from one census tract to another within the same county, but black and white respondents moved at the same rate across counties.[1]

Table 2 presents results of the growth curve modeling of neighborhood average family income. Model 1, the baseline model, shows that the sample as a whole first established an independent household in a neighborhood with an average family income of $37,964. The positive and statistically significant parameter estimate for the intercept of the linear growth rate (.968) shows that, as hypothesized, neighborhood income tends to increase as respondents age, although the negative coefficient for the intercept for the quadratic growth rate indicates that this upward trajectory levels off at older ages.

Model 2 of Table 2 allows both the initial status and the growth curve of average

Table 2. Growth Curve Models of Neighborhood Average Family Income: Panel Study of Income Dynamics, 1971 to 2011

	Neighborhood Average Family Income			
	Model 1	Model 2	Model 3	Model 4
Fixed Effects				
For Intercept (initial status)				
Intercept	37.964***	41.940***	29.074***	21.713***
	(.476)	(.514)	(1.171)	(1.418)
Black		−8.421***	−4.758***	−3.242***
		(.632)	(.702)	(.711)
Neighborhood average family income in adolescence			.248***	.235***
			(.026)	(.024)
For Linear Growth Rate				
Intercept	.968***	1.293***	.823***	.858***
	(.041)	(.053)	(.150)	(.149)
Black		−.769***	−.569***	−.560***
		(.083)	(.096)	(.094)
Neighborhood average family income in adolescence			.008**	.007**
			(.002)	(.002)
For Quadratic Growth Rate				
Intercept	−11.594***	−14.641***	−9.313***	−11.206***
	(.902)	(1.140)	(3.236)	(3.269)
Black		9.124***	7.045***	6.202**
		(1.858)	(2.143)	(2.142)
Neighborhood average family income in adolescence			−.090*	−.073
			(.043)	(.052)
Control Variables				
Married/cohabiting at *t*				1.063***
				(.242)
Number of children under age 18 at *t*				−.424***
				(.090)
Years of education at *t*				.402***
				(.071)
Family income at *t* − 1				.025***
				(.002)
Home ownership at *t*				.376
				(.243)
Family income in adolescence				.015***
				(.003)
Moved to different tract in same county between *t* − 1 and *t*				.634***
				(.196)
Moved to different county between *t* − 1 and *t*				2.401***
				(.316)
Random Effects				
Level-1: within-person	138.294***	138.570***	138.564***	137.571***
Level-2: in initial status	186.229***	137.081***	121.678***	121.129***
Level-2: in rate of change	.863***	.822***	.834***	.797***
Goodness-of-fit				
AIC	218548.7	218090.6	217906.9	217584.0
BIC	218630.8	218197.3	218038.3	217781.1
N of person-periods	27,237	27,237	27,237	27,237
N of persons	1,214	1,214	1,214	1,214

Note: Sample consists of black and white Panel Study of Income Dynamics respondents who established their own households between 1970 and 1979. Standard errors are in parentheses. Coefficients and standard errors for the quadratic growth rate are multiplied by 1,000.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

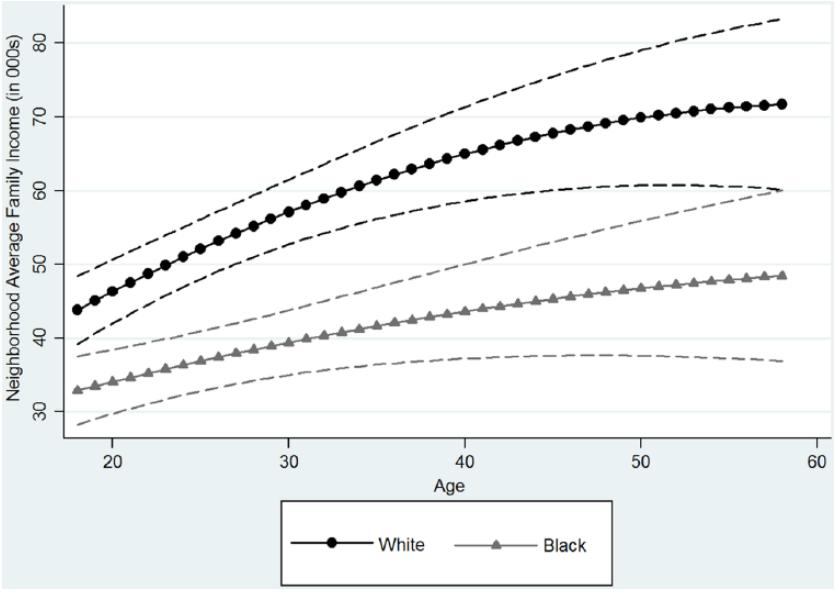

Figure 1. Growth Curve for Neighborhood Average Family Income, by Race: Panel Study of Income Dynamics, 1971 to 2011
Note: Dashed lines represent bounds of 95% confidence interval.

neighborhood family income to vary by respondent's race. The coefficient for black for the model intercept indicates that black respondents first established an independent household in a census tract with an average family income $8,421 less than that of white respondents' initial neighborhoods. More importantly perhaps, the negative and significant coefficient for black for the linear growth rate ($b = –.769$) shows that black respondents' improvement over the life course in the economic status of their neighborhoods falls substantially below that of white respondents, although the positive black coefficient for the quadratic growth rate implies less leveling off in black respondents' than white respondents' neighborhood income trajectories.

Figure 1 graphs the growth curves for neighborhood average family income, separately for black and white respondents, derived from the coefficients from Model 2 of Table 2. The pronounced racial difference in not only the economic status of the initial neighborhood, but also the subsequent trajectory of neighborhood economic status, is readily apparent. Importantly for our purposes, the predicted black-white difference in neighborhood average family income at age 50 is about double the corresponding initial difference at age 18. Moreover, it is not until black respondents were in their mid-50s that they were able to attain residence in neighborhoods of roughly the same economic status that white respondents were able to attain in their early 20s.

Table 3 presents results of a decomposition of the difference between white and black respondents in the average income of their residential neighborhoods at various ages. The first column in Table 3 presents the observed racial difference in neighborhood income at various ages. As shown here, and as illustrated in Figure 1, this difference increases with age, about doubling between ages 20 and 50. The second column presents the predicted white-black difference in neighborhood income if the growth curve for black respondents had the same intercept as the curve for white respondents, that is, if black respondents had started their neighborhood

Table 3. Decomposition of White-Black Difference in Neighborhood Average Family Income, by Age: Panel Study of Income Dynamics, 1971 to 2011

Age	Observed Difference	Predicted Difference Assuming Equal Intercepts	Percent of Observed Difference Attributable to Difference in Intercepts	Percent of Observed Difference Attributable to Difference in Trajectories
20	12.98	1.37	89.46	10.54
30	18.71	7.08	62.14	37.86
40	22.50	10.89	51.64	48.36
50	24.36	12.77	47.58	52.42

careers in neighborhoods of the same economic status that white respondents started out in. The third and fourth columns of Table 3 partition the observed white-black difference in neighborhood income into the percentage attributable to differences in intercepts and the percentage attributable to differences in trajectories, respectively.

At age 20, the vast bulk of the racial difference in neighborhood economic status is a result of black and white respondents starting out in different types of neighborhoods. With increasing age, however, this percentage drops rather sharply, such that by age 50, slightly less than half of the observed white-black difference in neighborhood income is attributable to racial differences in starting points and, equivalently, more than half is attributable to racial differences in the life course trajectories of neighborhood income. Illustrating how neighborhood disadvantage is transmitted over time, the difference in the economic status of the neighborhoods that black and white respondents first occupy upon leaving the parental household manifests throughout the life course, accounting for a substantial portion of the difference observed even as late as mid-adulthood. At the same time, the initial white-black gap in neighborhood economic status grows substantially as respondents age. That much of the racial difference in neighborhood economic status in mid-to-late adulthood occurs after black and white respondents have formed their first households would seem to leave ample room for the contemporaneous explanations of racial differences in neighborhood attainment posited by spatial assimilation and place stratification theories.

Model 3 of Table 2 adds to Model 2 the average neighborhood income that respondents experienced during adolescence, just prior to forming their own households. The positive and significant coefficient for neighborhood average family income during adolescence for the model intercept (b = .248) indicates that respondents who lived in a better-off neighborhood during adolescence tended to establish their own households in economically advantaged neighborhoods. This finding is consistent with the previously observed intergenerational transmission of neighborhood economic status (Sharkey 2008). Moreover, as indicated by its positive and significant coefficient for the linear growth rate (b = .008), neighborhood income during adolescence also shapes the trajectory of neighborhood economic status over the adult life course. Individuals who grew up in comparatively advantaged neighborhoods experienced better than average improvements in neighborhood economic status as they aged.

Also worth noting is that the racial difference in neighborhood income during adolescence explains a considerable portion of the racial difference in neighborhood income upon initial household formation; the coefficient for black for the intercept of the growth curve drops by about 40 percent (from −8.421 to −4.758) when adolescent neighborhood income is included in the model. Racial

differences in neighborhood income during adolescence also account for a nontrivial proportion of the racial difference in the trajectory of neighborhood economic status over the adult life course. The coefficient for black for the linear growth rate drops by about one-quarter (from –.769 to –.569) when adolescent neighborhood income is controlled. At the same time, the racial difference in the trajectory of neighborhood economic status remains substantial and statistically significant even when adolescent neighborhood income is held constant.

Model 4 of Table 2 adds the control variables. Being married, having higher family incomes both during adolescence and contemporaneously, and having higher levels of education are all associated with higher neighborhood incomes. Respondents with more resident children, however, resided in less advantaged neighborhoods. These associations, along with the overall racial difference in neighborhood economic status, are consistent with other studies of neighborhood attainment that do not rely on long-term panel data (Alba and Logan 1991; Logan and Alba 1993). Moving to a different census tract, especially one in a different county, is associated with higher neighborhood income. Controlling for these established predictors of neighborhood attainment diminishes modestly the racial difference in the economic status of the initial neighborhood of residence (b for black = −3.242), but it has little impact on the racial difference in the subsequent trajectory of neighbor income (b for black for the linear growth rate = −.560). The significant and substantial black-white difference in the trajectory of neighborhood economic status, even controlling for the contemporaneous values of income and education, suggests that mechanisms other than those emphasized by the spatial assimilation perspective are driving racial differences in neighborhood attainment over the life course. Moreover, that the racial difference in trajectories of neighborhood income persists even after controlling for residential mobility suggests this difference is driven more by racial differences in the neighborhood economic trajectories of non-mobile white and black respondents than by racially differentiated patterns of inter-neighborhood migration. That is, the neighborhoods stationary white respondents lived in improved more over time than did the neighborhoods stationary black respondents lived in.

Table 4 presents results of a parallel multilevel growth curve analysis of the percentage of respondents' tract population who are non-Hispanic white. Model 1 shows that the sample as a whole first established an independent household in neighborhoods where about 72 percent of the resident population was non-Hispanic white. The statistically significant intercepts for both the linear and quadratic growth rates reveal that individuals' neighborhood racial composition changed over their life course but the trend was not linear. Not surprisingly, Model 2 shows that neighborhood racial composition differed sharply between black and white respondents. Model 2 shows that, on average, white respondents first established households in neighborhoods that were almost 89 percent non-Hispanic white, whereas only about 29 percent of neighbors were non-Hispanic white in black respondents' first independent neighborhoods (29.366 = 88.587 – 59.221). Equally important, the significant racial difference in the linear growth rate (b for black = .259) reveals that the life course trajectories of neighborhood racial composition differed between black and white respondents.

Figure 2 graphs these trajectories. Along with the pronounced racial difference in the racial composition of their initial neighborhoods, this figure reveals some *convergence* in the racial composition of their neighborhoods as black and white respondents in this cohort aged. As white respondents aged, the neighborhoods they lived in became less populated by non-Hispanic whites. Black respondents' neighborhoods, however, at least through age 40, became slightly more populated by non-Hispanic whites. As a result, at age 18, black respondents who recently formed their own households lived,

Table 4. Growth Curve Models of Neighborhood Percent Non-Hispanic White: Panel Study of Income Dynamics, 1971 to 2011

	Neighborhood Percent Non-Hispanic White			
	Model 1	Model 2	Model 3	Model 4
Fixed Effects				
For Intercept (initial status)				
Intercept	71.993***	88.587***	39.394***	37.193***
	(.932)	(.739)	(2.498)	(2.716)
Black		−59.221***	−24.423***	−23.842***
		(1.269)	(2.036)	(2.042)
Neighborhood percent non-Hispanic white in adolescence			.537***	.531***
			(.026)	(.026)
For Linear Growth Rate				
Intercept	.235***	.005	.511**	.444**
	(.045)	(.057)	(.172)	(.172)
Black		.259**	−.116	−.084
		(.091)	(.165)	(.164)
Neighborhood percent non-Hispanic white in adolescence			−.006**	−.006***
			(.002)	(.002)
For Quadratic Growth Rate				
Intercept	−6.667***	−8.544***	−8.637*	−6.900
	(1.018)	(1.278)	(4.304)	(4.846)
Black		2.934	2.820	2.314
		(2.078)	(3.833)	(3.828)
Neighborhood percent non-Hispanic white in adolescence			.225	.134
			(.121)	(.102)
Control Variables				
Married/cohabiting at *t*				1.955***
				(.284)
Number of children under age 18 at *t*				.264**
				(.102)
Years of education at *t*				−.033
				(.079)
Family income at *t* − 1				.002
				(.002)
Home ownership at *t*				.654**
				(.204)
Family income in adolescence				.013
				(.008)
Moved to different tract in same county between *t* − 1 and *t*				.848***
				(.219)
Moved to different county between *t* − 1 and *t*				2.731***
				(.351)
Random Effects				
Level-1: within-person	172.342***	172.612***	172.789***	172.076***
Level-2: in initial status	1726.654***	519.138***	350.717***	343.959***
Level-2: in rate of linear change	1.221***	.982***	.957***	.946***
Goodness-of-fit				
AIC	225960.6	224401.6	223942.7	223824.0
BIC	226042.7	224508.4	224074.1	224021.1
N of person-periods	27,237	27,237	27,237	27,237
N of persons	1,214	1,214	1,214	1,214

Note: Sample consists of black and white Panel Study of Income Dynamics respondents who established their own households between 1970 and 1979. Standard errors are in parentheses. Coefficients and standard errors for the quadratic growth rate are multiplied by 1,000.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

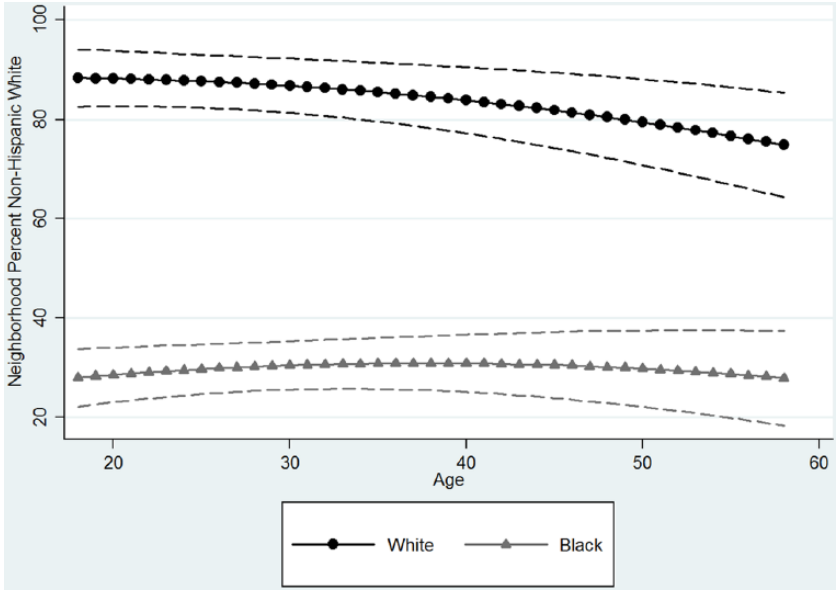

Figure 2. Growth Curve for Neighborhood Percent Non-Hispanic White, by Race: Panel Study of Income Dynamics, 1971 to 2011
Note: Dashed lines represent bounds of 95% confidence interval.

on average, in neighborhoods that were about 60 percentage points "less white" than the neighborhoods white respondents lived in, but by age 50, this difference dropped to about 50 percentage points. As suggested earlier, these different life course trends could reflect, in part, period changes in the overall racial composition of U.S. neighborhoods and metropolitan areas, as well as other factors that have generated declines in black-white residential segregation (Logan et al. 2004). Even with this slight convergence, however, at no stage of the life course did the average racial composition of the neighborhoods inhabited by black respondents come close to resembling the average racial composition of the neighborhoods inhabited by white respondents.

Model 3 of Table 4 adds respondent's neighborhood racial composition experienced during adolescence as a predictor. As was the case for intergenerational continuity in neighborhood income, we find considerable continuity in neighborhood racial composition: the coefficient for neighborhood percent non-Hispanic white experienced in adolescence (b = .537) is positive and statistically significant. And, the pronounced racial difference in the racial composition of initial neighborhoods is partly—although by no means entirely—explained by racial differences in the racial composition of the neighborhoods respondents lived in prior to establishing their own households. The coefficient for black for the Model 3 intercept drops by about half from its Model 2 value (from −59.221 to −24.423) when the percent white in the adolescent neighborhood is controlled.

Parallel to the findings for neighborhood income (Table 2), Model 3 of Table 4 shows that the racial composition of one's adolescent neighborhood is significantly associated with the subsequent life course trajectory of neighborhood racial composition. Here, the negative coefficient for neighborhood percent non-Hispanic white in adolescence for the linear growth rate (b = –.006) reveals that the "whiter" the neighborhood one lived in as a teenager, the greater the decrease (or shallower the increase) over time in the percentage of one's neighbors who are non-Hispanic white. Controlling for the racial composition

of the neighborhood one lived in during adolescence also eliminates the significant racial difference in the trajectory of neighborhood percent non-Hispanic white that we saw in Model 2.

Model 4 of Table 4 adds the control variables. Married respondents, families with more children, and homeowners tended to live in whiter neighborhoods than their unmarried counterparts with smaller families who rented their dwellings. Moving to a different census tract, especially one in a different county, is associated with residence in a whiter neighborhood. But as was the case for the analysis of neighborhood economic status, controlling for these covariates does little to alter the coefficients of primary interest: the sharp racial difference in the racial composition of initial neighborhoods, the positive association between adolescent neighborhood percent white and initial neighborhood percent white, and the negative effect of adolescent neighborhood percent white on this trajectory all remain essentially unchanged from Model 3.[2]

Race-Specific Models

Our analyses to this point tacitly assume that factors influencing trajectories of neighborhood attainment operate similarly for black and white respondents. This assumption may not be reasonable. Indeed, supplemental analyses clearly indicated that the influences of both adolescent neighborhood family income and adolescent neighborhood percent non-Hispanic white on subsequent trajectories in these neighborhood characteristics during adulthood differed significantly between black and white PSID respondents. Accordingly, the remaining analyses estimate models separately for the two racial groups.

Table 5 presents results of the race-specific growth curve models for neighborhood income. Models 1 and 3 show that the average income of the neighborhoods that white and black respondents lived in during adolescence bears a significant association with the trajectory of respondents' neighborhood income over the adult life course, but this association differs between black and white respondents. For white respondents, the coefficient for average neighborhood family income in adolescence for the linear growth rate is positive and statistically significant ($b = .012$), whereas the corresponding coefficient for black respondents is negative and statistically significant ($b = –.012$); the coefficients for the quadratic growth rate reveal the opposite pattern. These trajectories do not change when the control variables are included in Models 2 and 4.[3]

Figure 3 graphs these somewhat complex curves, plotting the predicted trajectories of neighborhood average family income for the group-specific values of neighborhood family income during adolescence at the first, second, and third quartiles of these distributions. Among white respondents, growing up in an economically advantaged neighborhood appears to confer a subsequent advantage in neighborhood attainment. The trajectories of the three groups categorized by their neighborhood income in adolescence diverged over the life course, as the fairly modest differences in the incomes of their residential neighborhoods at age 18 became, by age 50, moderately larger.

In contrast, although black respondents also benefited from growing up in higher-income neighborhoods in terms of the economic status of their initial neighborhoods, this benefit dissipated within about 10 years, and by age 40 there was little difference in neighborhood income among respondents who grew up in poor, middle class, or relatively advantaged neighborhoods. The difference between black respondents who grew up in the poorest neighborhoods and black respondents of other neighborhood origins did reappear as respondents entered their 50s. Perhaps at this stage of the life course, black respondents were re-establishing social ties—and spatial proximity—with kin who remained in relatively impoverished neighborhoods. The most important message from this figure, however, is that as they aged, black respondents appeared much less able

Table 5. Growth Curve for Neighborhood Average Family Income, by Race: Panel Study of Income Dynamics, 1971 to 2011

	White		Black	
	Model 1	Model 2	Model 3	Model 4
Fixed Effects				
For Intercept (initial status)				
Intercept	34.443***	25.421***	17.918***	13.862***
	(1.944)	(2.257)	(1.773)	(2.121)
Neighborhood average family income in adolescence	.174***	.081**	.408***	.391***
	(.033)	(.035)	(.046)	(.046)
For Linear Growth Rate				
Intercept	.611**	.682***	1.064***	1.070***
	(.184)	(.184)	(.182)	(.183)
Neighborhood average family income in adolescence	.012***	.011***	−.012**	−.012**
	(.003)	(.003)	(.005)	(.005)
For Quadratic Growth Rate				
Intercept	−4.992*	−7.042*	−16.949***	−18.425***
	(2.523)	(2.874)	(3.346)	(3.421)
Neighborhood average family income in adolescence	−.173***	−.165**	.314**	.303**
	(.062)	(.063)	(.113)	(.112)
Control Variables				
Married/cohabiting at *t*		.995***		.634*
		(.296)		(.315)
Number of children under age 18 at *t*		−.449***		−.437***
		(.136)		(.128)
Years of education at *t*		.563***		.143
		(.100)		(.100)
Family income at *t* − 1		.022***		.048***
		(.002)		(.007)
Home ownership at *t*		−.632*		1.792***
		(.322)		(.372)
Family income in adolescence		.069***		.040**
		(.011)		(.013)
Moved to different tract in same county between *t* − 1 and *t*		.600**		.674***
		(.233)		(.204)
Moved to different county between *t* − 1 and *t*		1.663***		3.675***
		(.411)		(.477)
Random Effects				
Level-1: within-person	159.238***	158.142***	104.640***	103.859***
Level-2: in initial status	423.766***	395.769***	89.287***	85.591***
Level-2: in rate of change	1.461***	1.360***	.522***	.486***
Goodness-of-fit				
AIC	131711.6	131510.0	85480.0	85306.7
BIC	131811.6	131671.5	85575.1	85460.3
N of person-periods	16,141	16,141	11,096	11,096
N of persons	696	696	518	518

Note: Sample consists of black and white Panel Study of Income Dynamics respondents who established their own households between 1970 and 1979. Standard errors are in parentheses. Coefficients and standard errors for the quadratic growth rate are multiplied by 1,000.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

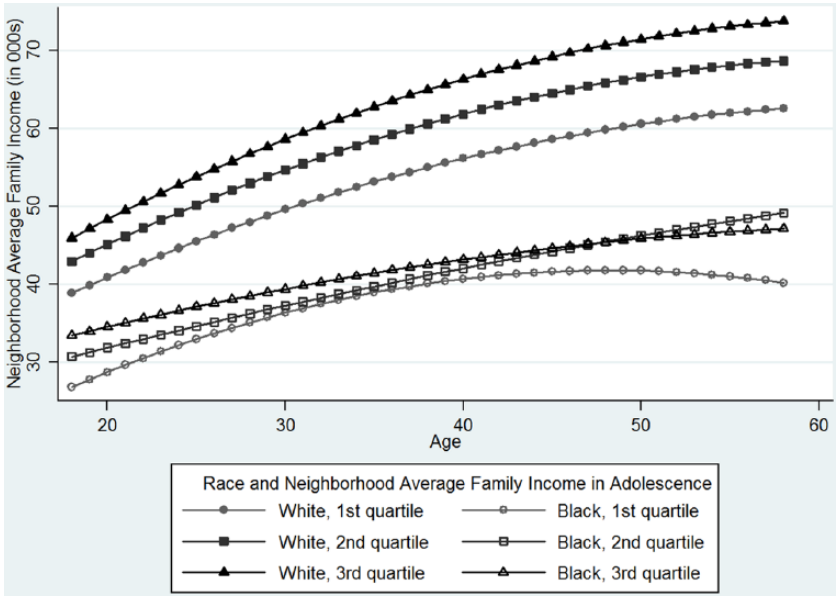

Figure 3. Growth Curve for Neighborhood Average Family Income, by Race and Neighborhood Average Family Income in Adolescence: Panel Study of Income Dynamics, 1971 to 2011

than white respondents to convert advantageous neighborhood origins into subsequent improvements in neighborhood economic status.

Table 6 presents the race-specific models for neighborhood percent non-Hispanic white. Among both white and black respondents, the racial composition of the neighborhood lived in during adolescence is significantly associated with both the racial composition of the initial neighborhood and the subsequent trajectory of neighborhood racial composition (Models 1 and 3). Echoing a finding from Table 5, however, the direction of the association between neighborhood percent non-Hispanic white experienced in adolescence and the subsequent trajectory of neighborhood racial composition over the life course differs between black and white respondents; the coefficient for neighborhood percent non-Hispanic white on the linear growth rate is positive and significant among white respondents, but negative and significant among black respondents, with the quadratic growth again showing the reverse pattern. Models 2 and 4 show that, for both black and white respondents, the association between adolescent neighborhood racial composition and the age-graded trajectory of neighborhood racial composition is modified only slightly by controlling for individuals' demographic and socioeconomic characteristics.

Figure 4 uses the parameter estimates from Models 1 and 3 of Table 6 to graph the growth curves of neighborhood percent non-Hispanic white, separately for black and white respondents. For each racial group, we generated predicted trajectories for respondents whose adolescent neighborhood percent non-Hispanic white fell at the first, second, and third quartile of the group's distribution.

As Figure 4 shows, black and white respondents who grew up in neighborhoods with a higher than average percentage of whites tended to maintain that position when they left the parental home and formed their own households. Among white respondents, these differences diverged slightly over the middle segment of the life course between individuals at the first quartile of the distribution—white respondents who resided in the least white neighborhoods—and the other

Table 6. Growth Curve for Neighborhood Percent Non-Hispanic White, by Race: Panel Study of Income Dynamics, 1971 to 2011

	White		Black	
	Model 1	Model 2	Model 3	Model 4
Fixed Effects				
For Intercept (initial status)				
Intercept	51.244***	50.750***	13.289***	5.191*
	(3.351)	(3.464)	(1.523)	(2.548)
Neighborhood percent non-Hispanic white in adolescence	.407***	.411***	.590***	.573***
	(.036)	(.036)	(.040)	(.039)
For Linear Growth Rate				
Intercept	−1.362***	−1.362***	.574***	.584***
	(.270)	(.270)	(.126)	(.134)
Neighborhood percent non-Hispanic white in adolescence	.014***	.014***	−.013***	−.012***
	(.003)	(.003)	(.003)	(.003)
For Quadratic Growth Rate				
Intercept	40.106***	40.276***	−11.087***	−11.276***
	(6.134)	(6.142)	(3.094)	(3.387)
Neighborhood percent non-Hispanic white in adolescence	−.527***	−.502***	.179**	.168**
	(.067)	(.067)	(.061)	(.061)
Control Variables				
Married/cohabiting at *t*		.624**		3.434***
		(.242)		(.609)
Number of children under age 18 at *t*		.377***		.005
		(.106)		(.229)
Years of education at *t*		−.094		.230
		(.068)		(.182)
Family income at *t* − 1		.002		.016
		(.001)		(.012)
Home ownership at *t*		1.059***		−.524
		(.231)		(.651)
Family income in adolescence		.005		.084**
		(.008)		(.026)
Moved to different tract in same county between *t* − 1 and *t*		.825***		.904**
		(.200)		(.340)
Moved to different county between *t* − 1 and *t*		.431		7.924***
		(.284)		(.829)
Random Effects				
Level-1: within-person	75.410***	75.203***	312.893***	310.959***
Level-2: in initial status	336.023***	336.767***	472.056***	434.354***
Level-2: in rate of change	.703***	.702***	1.304***	1.309***
Goodness-of-fit				
AIC	119795.6	119740.8	97856.1	97714.2
BIC	119895.5	119902.3	97900.0	97816.6
N of person-periods	16,141	16,141	11,096	11,096
N of persons	696	696	518	518

Note: Sample consists of black and white Panel Study of Income Dynamics respondents who established their own households between 1970 and 1979. Standard errors are in parentheses. Coefficients and standard errors for the quadratic growth rate are multiplied by 1,000.
*$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed tests).

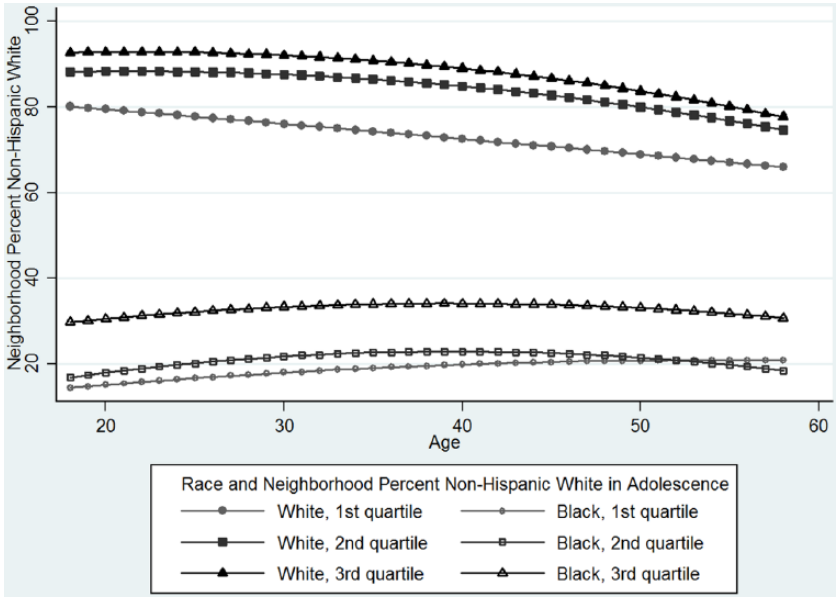

Figure 4. Growth Curve for Neighborhood Percent Non-Hispanic White, by Race and Neighborhood Average Percent Non-Hispanic White in Adolescence: Panel Study of Income Dynamics, 1971 to 2011

neighborhood-origin groups. Among black respondents, however, group differences converged, albeit only slightly, over time. In particular, black respondents who grew up in the whitest of the three neighborhood groupings were unable to completely maintain their position relative to co-ethnics who grew up in neighborhoods with fewer whites.

Sensitivity Analyses

Sample attrition is a challenge to virtually all life course studies that follow individuals for a substantial period of time, as not all eligible respondents are interviewed at every wave. In the PSID, approximately 1 to 3 percent of eligible households leave the sample every year, and this problem is compounded by periodic reductions in sample size, particularly the discontinuation of the low-income, Survey of Economic Opportunity (SEO) subsample in 1997. In the face of attrition, selecting an appropriate sample for long-term longitudinal studies involves a tradeoff between obtaining a representative sample of respondents and obtaining a representative sample of observed trajectories. Similar to a problem encountered in other multilevel studies (Lucas 2014), obtaining a representative sample of respondents does not ensure obtaining a representative sample of trajectories, because respondents who leave the survey early may have had unobserved post-attrition experiences that differ from the respondents who remained in the survey.

To assess the possible influence of sample attrition (broadly construed) on our results, we replicated all the analyses using two different sample selection criteria. In one sample, we selected all PSID respondents born between 1953 and 1962 and who first established an independent household during the 1970s—part of our original sample selection criteria—and who provided the requisite data for our analysis in at least one subsequent wave of interviews. This selection criterion results in a larger sample of respondents than that used in the main analyses (N = 1,673 versus 1,214) but fewer person-years of observation per respondent (18.3 versus 22.4). In another replication, we selected the initially eligible respondents from this cohort

who provided the requisite data for more than half of the waves they could have been interviewed, including at least two waves between 1997 and 2011 (hence omitting the SEO sample). This selection criterion results in fewer respondents than in the main analysis (N = 740) but more person-years of observation per respondent (25.1). With few exceptions, both supplementary samples generated results similar to those observed in the main analyses. Consequently, our results do not appear to be negatively affected by the failure of all eligible PSID respondents to provide the requisite data for our analyses at every possible interview wave.

DISCUSSION AND CONCLUSIONS

Research on how families and individuals attain residence in different types of neighborhoods has begun to draw on the life course approach, but efforts to fully develop a life course perspective on neighborhood attainment have been hampered by the absence of—or failure to exploit—long-term, individual-level panel data covering more than a decade or so of the adult life course subsequent to initial household formation. We attempted to redress this limitation by using prospective data from the subset of respondents to the Panel Study of Income Dynamics who established their own households during the 1970s, tracking these respondents—and recording their neighborhood characteristics—into mid-to-late adulthood. We described and explored variability in the trajectories of neighborhood characteristics using multilevel growth curve models, paying particular attention to differences by race and by the types of neighborhoods inhabited during adolescence. We believe our approach and findings will help develop a life course perspective on neighborhood attainment. Our analysis leads to three main conclusions.

First, as they aged, most respondents experienced an improvement in the economic status of their residential neighborhoods, presumably in part because increases in income and wealth over the life course allow for the purchase or rental of dwellings in more desirable neighborhoods. But such improvements were substantially greater among white than among black respondents. Indeed, by age 50, the black-white difference in average neighborhood income was about double what the difference had been when these respondents first left their parental home and established their own households. The exacerbation, rather than the mere continuation, over the adult life course of the initial racial difference in neighborhood economic status implies that the forces that cause blacks and whites to live in neighborhoods with starkly different economic profiles operate to a significant degree on black and white *adults*. That the pronounced racial difference in these trajectories remains even after taking into account racial differences in both individual economic status and the economic status of neighborhoods inhabited during adolescence suggests that forces in addition to racial and class inequality are driving these trajectories. These forces ostensibly include, for black individuals, the discriminatory housing practices emphasized by place stratification theory, as well as racially differentiated housing search strategies (Krysan and Bader 2009). Such forces might also include the need or desire to maintain geographic proximity to kith and kin over the life course. Black individuals' perceived obligations to live close to family members—who themselves tend to reside in comparatively poor neighborhoods—may impede migration to better-off neighborhoods and encourage the return migration of people who had previously attained residence in these areas (McDonald and Richards 2008). The divergence over the life course in the economic status of the neighborhoods inhabited by blacks and whites likely stems not only from different inter-neighborhood migration patterns, but also from greater improvements (or less deterioration) in the neighborhoods inhabited by non-mobile whites relative to the neighborhoods inhabited by non-mobile blacks.

A second overarching conclusion to be drawn from our analysis is that, for any given cohort, trajectories of neighborhood attainment are likely shaped by broader structural

and historical forces. This conclusion derives especially from our analysis of race-specific trajectories in neighborhood racial composition, measured here by the percentage of the neighborhood population that is non-Hispanic white. In contrast to our finding of racial *divergence* in the economic status of residential neighborhoods, we find evidence of racial *convergence* in neighborhood racial composition, mainly because over the life course, white respondents in our analytic cohort tended to live in neighborhoods that were more and more composed of ethno-racial minorities. This increase in the percentage of white respondents' neighbors who were other than non-Hispanic white likely reflects changes in the overall racial composition of U.S. neighborhoods, along with declining levels of racial residential segregation (Fischer and Lowe 2015; South et al. 2011). This result also suggests that declines in racial segregation are not simply a matter of inter-cohort change (or cohort replacement), but rather reflect actual changes over the life course in individuals' neighborhood environments. At the same time, however, our findings reveal pronounced differences between blacks and whites in the ethno-racial composition of their neighborhoods at all stages of the life course.

Third, and broadly consistent with a central tenet of the life course perspective, we find that the type of neighborhood individuals inhabit during adolescence is associated with the type of neighborhood they inhabit later in life. Along with other recent studies (Britton and Goldsmith 2013; Marsh et al. 2011; Sharkey 2008; Swisher et al. 2013), we observe considerable continuity in neighborhood economic status and neighborhood racial composition from adolescence to initial independent household formation, reflecting the transmission of neighborhood advantage and disadvantage across generations. But we also observe longer-term associations between adolescent neighborhood characteristics and the subsequent trajectories of neighborhood attainment. For example, we find that white respondents who resided in a comparatively advantaged neighborhood in adolescence increased their advantage over other whites as they aged. In contrast, black respondents who grew up in the most advantaged neighborhoods were generally unable to maintain this advantage in neighborhood conditions over time. Future research might profit by exploring the individual and structural mechanisms linking adolescent neighborhood characteristics to the characteristics of neighborhoods that individuals initially live in as independent adults, and to their subsequent trajectories of neighborhood attainment.

Our results also suggest that racial differences in the life course trajectories of neighborhood economic status are driven at least as much by how neighborhoods change around non-residentially-mobile blacks and whites as by racial differences in inter-neighborhood residential mobility. This tentative finding suggests that housing mobility programs, such as the Moving to Opportunity Experiment (Briggs, Popkin, and Goering 2010), that are designed to relocate poor and minority families from disadvantaged neighborhoods to better-off communities will not necessarily result in a marked racial convergence in neighborhood economic status, because much of the divergence in neighborhood SES over the life course results from *in situ* change—that is, differences in how predominantly black and predominantly white neighborhoods change over time.

The development of a comprehensive life course perspective on neighborhood attainment would benefit from pursuing other lines of research as well. There is, of course, the need to expand coverage of the life course into the older ages, where residential moves in retirement and for health reasons may entail relocation to neighborhoods with characteristics different from those inhabited earlier in life. Different cohorts may experience different trajectories of neighborhood attainment as well as different associations between childhood neighborhood characteristics and adult neighborhood characteristics. The cohort followed in our analysis began establishing their own households not long after

passage of the 1968 Fair Housing Act. Although enforcement of this legislation was initially lacking (Massey and Denton 1993), subsequent abatement of the most overt forms of housing discrimination may have helped weaken the links between African Americans' childhood neighborhood characteristics and initial adult neighborhood characteristics, and between their initial adult neighborhood characteristics and subsequent trajectories of neighborhood attainment, relative to earlier cohorts. More vigorous enforcement of fair housing laws may further attenuate these connections for later cohorts. Exploring the life course trajectories of other cohorts may also help separate age effects from period effects on neighborhood attainment.

Because of data constraints, our analysis focused only on the neighborhood attainments of black and white respondents, but a comprehensive life course account will clearly require consideration of other racial and ethnic groups, particularly Latinos and Asians, as well as possible differences by gender. The development of a complete picture of how neighborhood environments change over the life course would likely profit from incorporating neighborhood characteristics beyond their socioeconomic and ethno-racial composition. Future research on neighborhood attainment over the life course might also profit from exploring the mechanisms generating age-graded changes in neighborhood conditions—and racial differences therein. Differentiating improvements in neighborhood economic conditions engendered by residential mobility between different types of neighborhoods from *in situ* improvements should be high on the research agenda. A thorough understanding of the latter source of change will require research on why the neighborhoods typically inhabited by whites tend to experience greater improvements in economic status over time than do the neighborhoods typically inhabited by blacks.

More research is also needed on the mechanisms linking adolescent neighborhood characteristics and neighborhood characteristics at initial household formation to subsequent trajectories of neighborhood attainment. The vast literature on "neighborhood effects" (e.g., Sampson, Morenoff, and Gannon-Rowley 2002) suggests that growing up, or starting out, in an economically advantaged neighborhood leads to improvements in human capital and other individual characteristics that could enable subsequent relocations to even more advantaged neighborhoods (South and Crowder 1997). Similarity between childhood neighborhood characteristics and the characteristics of young adults' neighborhoods could be driven, in part, by simple geographic proximity, since young adults often establish their first household near their parents' home (Sharkey 2008). Growing up in a neighborhood characterized by a particular racial composition could also shape youths' preferences for the racial composition of the neighborhoods they inhabit later in life (Britton and Goldsmith 2013).

Improvements in neighborhood conditions with age might also result from a process of cumulative advantage, in which initial residence in an advantaged neighborhood generates resources that allow for subsequent improvements, which in turn allow for even more improvement. At the individual level, higher rates of housing appreciation—and hence home equity growth—in high-income compared to low-income neighborhoods could allow for the continued purchase of new homes in increasingly better-off neighborhoods. Neighborhood upgrading itself may also be a cumulative process, as initial improvements in neighborhood economic status draw in somewhat better-off residents, who in turn draw in even better-off residents—a self-reinforcing cycle in which rich neighborhoods get richer and poor neighborhoods get (relatively) poorer. Finally, given the ostensible importance of macro level historical trends and events for explaining age-graded changes in neighborhood racial composition, further research is needed to identify the demographic, structural, and policy-related forces that shape the neighborhood environments of specific cohorts as their members advance through the life course.

The analysis presented here lays the groundwork for a more thorough understanding of how individuals' neighborhood environments change throughout the life course. Our most important findings concern racial differences in the trajectories of neighborhood economic status. Some prior research on the sources of racial inequality in neighborhood attainment stresses the appearance of these differences early in life (e.g., Sharkey 2008), whereas studies of racial differences in inter-neighborhood migration (e.g., Crowder et al. 2006; Quillian 2002) and patterns of neighborhood change (e.g., Owens 2012) suggest that the residential dynamics experienced by adults also contribute to this racial inequality. We find that both different neighborhood origins and different life course trajectories contribute significantly to the racial difference in neighborhood economic status in middle adulthood. Compared to whites, blacks are doubly disadvantaged in their ability to attain residence in higher-income neighborhoods. Not only do blacks begin their neighborhood careers in poorer neighborhoods than do whites, they also experience less improvement in the socioeconomic status of their neighborhoods as they age. By mid-to-late adulthood, about half of the black-white difference in neighborhood income is attributable to different neighborhood origins and about half is attributable to different trajectories of neighborhood attainment. Thus, both inherited, or durable, inequality *and* constructed inequality play important roles in generating racial differences in neighborhood attainment over the life course.

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Notes

1. Virtually all respondents in our sample moved between census tracts at least once over the study period. Cumulatively, the average number of inter-tract moves is 7.1 for black respondents and 6.6 for white respondents.
2. We do not present a decomposition of the white-black difference in neighborhood racial composition parallel to that for neighborhood income (Table 3), because it is clear from Figure 2 that even at older ages this difference is largely a continuation of the black-white difference in neighborhood racial composition at initial household formation.
3. The inverse net association between home ownership and neighborhood income among white respondents is puzzling, but it could reflect high rates of home ownership in economically stagnant, older white neighborhoods, or the bequeathing of homes from parents to downwardly mobile children (Sharkey 2008).

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Scott J. South is Distinguished Professor of Sociology at the University at Albany, SUNY. His research examines racial and ethnic differences in neighborhood attainment, the impact of residential mobility and neighborhood context on adolescent behavior, and the social consequences of imbalanced sex ratios in the United States, China, and India.

Ying Huang is a PhD candidate in Sociology at the University at Albany, SUNY. Her research interests include urban sociology, social stratification, and population health. Her current research examines variation in neighborhood inequality over time and across racial/ethnic groups. She also studies the social, spatial, and policy interactions that produce and reproduce racial and ethnic disparities in health.

Amy Spring is an Assistant Professor in the Department of Sociology at Georgia State University. Her research is directed at understanding spatial inequality, residential mobility, and neighborhood effects on health and aging.

Kyle Crowder is the Blumstein-Jordan Professor of Sociology at the University of Washington and a faculty affiliate in the Center for Studies in Demography and Ecology and the Center for Statistics in the Social Sciences. His research focuses on the processes of residential differentiation, segregation, and the effects of physical and social context on individual health and development.